

**ANALYSIS OF AND DEVELOPMENT
RECOMMENDATIONS FOR VIRTUAL CAMPUS
SERVICES IN LAPLAND UAS**

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Bachelor's Thesis
School of Business and Culture
Degree Programme in Business Information Technology
Bachelor of Business Administration

2015

School of Business and Culture
Degree Programme in Business
Information Technology

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|----------------------------|--|-------------|------|
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| Commissioned by | Lapland University of Applied Sciences | | |
| Title of thesis | Analysis of and Development Recommendations for Virtual Campus services in Lapland UAS | | |
| No. of pages + app. | 74 + 34 | | |

The word campus is often used by universities to refer to the space where physical facilities are situated. In the present time, higher educational institutions utilize many computer-based tools to enhance study processes, which are often referred to as Virtual Campus services. Despite the fact that almost every university applies virtual tools beyond regular practices, there is no common understanding about the meaning of and the tools used in a Virtual Campus.

The objective of this study is to define the concept, explain the popularity and analyse the characteristics of Virtual Campus services. An exploratory research of relevant literature is conducted to discover the concept, the typical users and the faced challenges of Virtual Campuses. The study connects the principles of the emerging worldview of Service-Dominant Logic to Virtual Campus services.

The research specifically analyses Virtual Campus services utilized at Lapland University of Applied Sciences as a single case study. The qualitative and quantitative data was collected through in-depth interviews and a questionnaire survey. Additional insight into the case organization was drawn from the researcher's experience as a student of the institution. The quantitative data was analysed using the SERVQUAL methodology. The study includes user satisfaction measurement and service quality gap analysis. This study makes recommendations for development possibilities for the institution.

The results indicate that Lapland University of Applied Sciences utilizes too many different third-party tools amongst Virtual Campus services. The separate environments cause confusion and dissatisfaction among the users. The improvement of overall service quality could be possible by involving users in a unique service design. By following principles of Service-Dominant Logic and using the proposed framework, the users and the organization could cooperatively improve the service quality and fill the gaps between users' expectations and perceptions.

Key words Virtual Campus, user satisfaction, service quality, SERVQUAL, Service-Dominant Logic

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SYMBOLS AND ABBREVIATIONS

| | |
|--------------------|--|
| AD | Active Directory |
| FP | Foundational Premise |
| GDL | Goods-Dominant Logic |
| IT | Information Technology |
| Lapland UAS | Lapland University of Applied Sciences |
| SDL | Service-Dominant Logic |
| VC | Virtual Campus |
| VLE | Virtual Learning Environment |

1 INTRODUCTION

The background information, the main topic and motivation of this study are presented initially. Further, the main objectives of the research are described. Finally, the structure of the thesis is given.

1.1 Background and motivation

Education is an essential part of the global economy in the present time. The importance of higher education has raised intensively, the presence of a university diploma is almost essential to achieve a sufficient financial status (Immerwahr & Foleno 2000, 1-2). A research suggests that “A college education topped the list of responses when we asked people to choose one thing that can most help a person to succeed in the world today” (Immerwahr & Foleno 2000, 2). Participation in higher education and the achievement of a diploma have become key to success. Nevertheless, the learning process does not stop after graduation. The rapid growth of technology always brings about new innovations, tools and services which might reshape the present world (Mareco 2014a). Thereby, society develops itself, keeps up-to-date with the new innovations of the modern world.

The Internet is one of the major innovations of the 20th century, which has absolutely redesigned the modern society. Numerous new possibilities, services, solutions, jobs, communication, advertising and information access channels are constantly emerging (Castells 2014, 12). At the same time, many standard solutions have started to disappear as they are replaced by digital methods. Digitalization has created new worldviews and led to the concept of service-oriented and network society. (Castells 2014, 11-15; Vargo & Lusch 2004.) Digital solutions have effects on many fields of science, economy and education. According to Mareco (2014b), the application of technology helps 76% of students to achieve academic outcomes and prepare for future educational plans.

The education sector has expanded quickly in every part of the world during the recent decades. Many services based on Web-solutions and new teaching methods has appeared, which form essential part of educational processes today (Mareco 2014a). Many universities offer virtual classrooms for learning and teaching purposes to their students and employees (Lampinen & Hagström 2002, 4). Digitalization and globalization have created the possibility and the demand for distance learning in many fields of education. In the present time, many institutions use Virtual Learning Environments (hereinafter VLEs) to support students' studies (Lampinen & Hagström 2002, 4). Numerous institutions offer several courses or even complete educational programs conducted fully online, where students study distantly in VLEs (Re ViCa 2011). New communication channels, i.e. e-mailing were created thanks to Computer Science. Furthermore, administration processes shifted from traditional, paper-based materials to electronic documents.

The application of competences is a key factor to success in the present time (Vargo & Lusch 2004, 4). As Immerwahr and Foleno (2000, 1-2) emphasize, professional growth and success derives from education. According to studies of Saleem, Saghir, Akhtar, Bibi and Asif (2012, 4), "learning environment is the most influential factor on the students' satisfaction" and study outcome. Higher education institutions often use the word campus to refer to the space where their facilities are situated. The technological changes influencing higher education resulted into the extension of this concept, as Virtual Campus (hereinafter VC) services became an essential element of universities. VC services provide virtual study space beyond the traditional, physically located facilities, which is an essential part of students' learning environment in the present time. (Re ViCa 2011.) Mareco (2014a), Saleem *et al.* (2012), Bolliger and Wasilik (2009) agree that technology facilitates learning with high impact and to guarantee the best learning outcome, both physical facilities and VLEs require high quality design. However, on one hand, every university has a VC but, on the other hand, there is no common understanding about the meaning of its concept (Re ViCa 2011).

One of the reasons why this research is conducted is that educational institution has to deal with the issue of technological influence. As highlighted above, the proper design of virtual and physical learning environments is crucial to facilitate study processes amongst many other aspects. This research aims to highlight the importance of VC services and tools at higher educational institutions and to suggest guidelines on the service design.

Another motivation of this research is the researcher's personal interest and experience as a student of Lapland University of Applied Sciences (hereinafter Lapland UAS). The researcher has studied previously in other European higher educational institution, and therefore his prior experience and observations concerning VC services support the study. Based on this research, the employees of eLearning Service Centre and IT Service Desk at Lapland UAS can analyse and improve the overall VC service quality.

Lapland UAS is the case organization in this research. The institution was established on 1 January 2014 through the merger of two local higher educational institutions: Kemi-Tornio University of Applied Sciences and Rovaniemi University of Applied Sciences (Lapland UAS 2015b; Lindholm 2015b, 11). Currently the institution maintains physical campuses in Rovaniemi, Kemi and Tornio. Additionally, the institution deals with significant amount of distant education, as many courses are held in virtual classrooms throughout several degree programmes. (Lapland UAS 2015b; Lindholm 2015b, 11.) Therefore, the analysis of VC services utilized at the organization is relevant and interesting for this research.

The employees of eLearning Service Centre (eOppimispalvelut) are the commissioners of this study. The role of eLearning Service Centre at Lapland UAS is to offer trainings and support users concerning the usage of VC services. The employees of eLearning Service Centre are the main connection point in Lapland UAS between VC services and end-users. Therefore, the eLearning developers and trainers have wide view and understanding of users' perceptions regarding VC services at the organization, which essentially contributes to the current research. Accordingly, the expertise of employees at eLearning Service Centre is

involved throughout this study in order to guarantee better understanding concerning the utilized tools and relevant outcomes for the organization.

1.2 Research scope and objectives

Initially, the study explores the concept of VC services. The study analyses the characteristics, features, typical user groups, their needs and expectations of VC services utilized in higher education. This study identifies the most common tasks performed and typical challenges experienced by users in a VC environment. Additionally, this thesis addresses the importance of high quality service design and its impact on users' satisfaction.

Specifically, this research analyses the current package of and the users' satisfaction with the VC services provided at Lapland UAS. The users are students, teachers and staff members. This thesis discovers gaps between user expectations and perceptions of the VC service design at Lapland UAS. Since Lapland UAS has many international students with different cultural backgrounds and significant amount of distance education, the wide variety of users, especially students are being considered.

The objective of the thesis is to discover possible gaps in the VC service design of Lapland UAS. Based on this analysis, suggestions for improvements and further development of the services are made. It is discussed, how service processes could be updated to result in an improved VC service quality. Furthermore, the study reveals possibilities of how the current software systems can cooperate with each other, what functions are missing and what the unnecessary ones are. Finally, a cooperation framework is proposed in order to involve stakeholders in the service design and improve the overall service quality even more.

The scope and extent of this study does not include the implementation of the proposed features. However, the implementation of the suggestions is an interesting direction for further research and development. The researcher is willing to participate and provide assistance in the future development of the VC services

in Lapland UAS. Due to the limited scope of a Bachelor's Thesis, the conducted interviews involve mostly experts and students, whose competencies and study field are related to Information Technology (hereinafter IT). This research focuses on the Information and Communications Technology department of the organization and the way they interact with VC services.

1.3 Thesis structure

The thesis is divided into seven chapters. A short introduction, the background, the motivation, the scope and the objectives were described in this chapter. In chapter 2, the research questions are presented and explained. Further, the research methodology is described. An overview of VC services in higher education is presented in chapter 3. The understanding, needs, application fields, characteristics and challenges of VC services are discussed, the typical user classes and their expectations regarding the services are analysed. Chapter 4 introduces the emerging worldview of Service-Dominant Logic and applies the principle in relation to VC services. Chapter 5 is dedicated to analyse the VC services utilized at Lapland UAS based on the empirical data collected through a questionnaire survey, interviews and the researcher's own experience. Chapter 6 is devoted to propose suggestions and improvement possibilities for Lapland UAS to enhance users' satisfaction and overall VC service quality. Furthermore, a cooperation framework is introduced which is intended to involve users in the value co-production. Finally, chapter 7 concludes the results of the research and outlooks for further studies.

2 RESEARCH QUESTIONS AND METHODOLOGY

The research questions and research methodology are in the focus of this chapter. The chapter is divided into two sections. The first section presents and discusses the research questions, while the second chapter describes the research methods utilized through this study.

2.1 Research questions

The research questions are presented and described. The questions are as follows:

1. What is the conceptual understanding of VC and how are different actors involved in the service process?

This research question aims to discover how digitalization has influenced the education sector. The area and functionalities covered by VC services utilized in higher education are analysed. The most typical service operations, characteristics, user classes and challenges are discussed. Furthermore, the different goals, expectations and needs of different users are investigated.

2. How are Virtual Campus services organized at Lapland UAS and what is the current level of user satisfaction with the VC service process and tools?

The research question aims to analyse the structure and the components of VC services utilized at Lapland UAS. The service quality and level of user satisfaction are measured. The possible service quality gaps between users' expectations and perceptions are discovered and analysed. Discussions and analysis of how users participate in and how they experience the service are conducted. The expertise of personnel working at eLearning Service Centre is taken advantage of in the questionnaire design and analysis.

3. How is it possible to enhance users' experience and to improve the quality of VC services in Lapland UAS?

The analysis aims to make proposals for how to enhance the level of user satisfaction and the service quality. Based on the analysis, proposals for possible improvements in the VC service design of Lapland UAS are made. Ultimately, answers are pursued to the question of how is it possible to fill the gaps between users' expectations and perceptions about VC services and improve overall service quality.

2.2 Research methodology

The research consists of a theoretical and a practical part. First, exploratory and descriptive research is carried out to discover the understanding, application fields, functions, intended users and challenges of VC services by drawing from relevant literature. As Eisenhardt and Graebner (2007, 3) emphasize, "Sound empirical research begins with strong grounding in related literature, identifies a research gap, and proposes research questions that address the gap". Further, the concept of VC is integrated to the emerging worldview of Service-Dominant Logic, based on relevant literature research and the interview conducted with enterprise architect Lindholm (2015a). The established secondary sources acquired through scientific electronic libraries and e-resources are used to conduct the theoretical part of this thesis work. As the research includes an empirical part, the exploratory research of relevant literature forms the basis of understanding and solving the research problem.

In the empirical part of the research, the VC service package of Lapland UAS as a single case study is analysed based on qualitative and quantitative data. As Yin (2009, 4) points out, case study is a research method broadly used in many fields of sciences. The case study allows the researcher understand the social phenomena of the organization and gain in-depth overview about the processes (Yin 2009, 4). In case study research, multiple primary sources of information are

available to collect qualitative data about the organization (Eisenhardt & Graebner 2007, 4; Yin 2009, 19; Lindholm 2015b, 29). The primary sources used for this research are described in the sections to follow.

Quantitative and qualitative data collection for the practical part is conducted through multiple primary sources. The method triangulation includes the researcher's own experience, a user satisfaction survey and in-depth interviews with a selected group of users. The aim of collecting data through these techniques is to discover users' experience about VC services utilized at Lapland UAS.

In-depth interviews were conducted to collect qualitative data concerning users' perceptions about VC services at Lapland UAS. As Yin (2011, 134) argues, the interview technique allows the researcher to explore the interviewees' perceptions and collect a relevant amount of qualitative data. The interview scenarios were semi-structured, in order to conduct open conversations and allow the interviewees to freely express their views and perceptions. Amongst the interviewees, all user groups were represented and at least two representatives of each group were interviewed. In total 8 interviews were conducted for the research involving 2 students, 2 teachers and 4 staff members of the university. The transcripts of the interviews conducted for the research are included in Appendices 3-10.

A questionnaire survey was conducted to collect qualitative and quantitative data concerning users' satisfaction and experiences about VC services at Lapland UAS. As Groves *et al.* (2004, 4) highlights, "the measurement of attitudes is a key foundation of modern management philosophies that place much weight on customer satisfaction". Customer satisfaction surveys are ubiquitous tools for organizations (Groves *et al.* 2004, 5), because using questionnaires many customers can be reached in short time without physical limitations.

The SEVQUAL methodology is utilized in the questionnaire in order to discover gaps between users' expectations and perceptions. SERVQUAL is a popular

methodology developed during the past three decades by Parasuraman, Zeithaml and Berry (1985, 1986, 1988, 1991, 1993, 1994; Zeithaml, Parasuraman, & Berry 1990). The goal of the measurement methods is to identify and assess different perspectives of the service delivery, such as content, process, structure, outcome and impact (Fitzsimmons 2006, 133-134). The SERVQUAL instrument is a commonly accepted and widely used method to determine service quality (Shahin 2006, 4). Van Iwaarden *et al.* (2003 cited by Shahin 2006, 4) defines five generic dimensions of service quality, also known as RATER model, as follows:

- **“Tangibles:** Appearance of physical facilities, equipment, personnel, and communication materials.
- **Reliability:** Ability to perform the promised service dependably and accurately.
- **Responsiveness:** Willingness to help customers and provide prompt service.
- **Assurance:** Knowledge and courtesy of employees and their ability to convey trust and confidence.
- **Empathy:** The caring, individualized attention the firm provides its customers.” (Shahin 2006, 4 citing Van Iwaarden *et al.* 2003.)

In accordance with the SERVQUAL instrument, for each dimension custom amount of Likert-statements are formed in pairs. One statement is measuring the expectations, meanwhile the other one is measuring the perceptions of the customer for the investigated service. Finally, the differences between results are represented as SERVQUAL scores. Based on the analysis of the scores, the level of user satisfaction is estimated and recommendations are made at what point the service design could be improved. (Shahin 2006, 4-5.)

The reason for choosing the SERVQUAL method is that this technique is suitable to discover the level of user satisfaction regarding VC services at Lapland UAS.

The dimensions stated by Shahin (2006, 4 citing Van Iwaarden *et al.* 2003) can be applied in relation to VC services. Analysing the survey results allows the researcher to discover any possible gaps and suggest development possibilities to improve service quality at the necessary dimensions.

The online questionnaire tool is used to collect empirical data for the analysis. Since the users are situated in three different campuses, the online survey tool is suitable, because it allows to reach more users under a short time period. Additionally, respondents can fill in the forms anytime without any space and time constraints. The targeted respondent group for the survey are students, teachers and staff members of Lapland UAS. The survey was conducted both in the English and Finnish languages (Appendices 1 & 2), because majority of respondents speak Finnish as their native language and they might not be familiar with the complicated vocabulary of the foreign questions and statements. Furthermore, answering the questions in their native language also assists in expressing views and perceptions easier. The online survey was created using Google Forms tool.

The survey is divided into four parts and includes 34 questions in total. The first part of the questionnaire is collecting personal information through 6 category questions. The second part is designed according to the SERVQUAL method and contains 20+20 paired statements to measure service quality of VC services. The statements of question 7 are measuring the user expectations, while the statements of question 8 are measuring the perceptions. As shown in Table 1, each statement is categorized according to the dimensions defined by SERVQUAL.

Table 1. SERVQUAL dimensions matched to statements in the survey

| Dimension | Statement number in question number 7 and 8 |
|------------------|--|
| Reliability | 1-3 |
| Responsiveness | 4-7 |
| Assurance | 8-10 |
| Empathy | 11-12 |
| Tangibles | 13-20 |

Statements 1-3 focus on reliability of and files uploaded to the online environments. Further, statements 4-7 aim to measure responsiveness which means the promptness, availability and understandability of VC services. Statements 8-10 focus on assurance, which means how easy it is to contact eLearning employees and how fluently they deal with user requests in the VC environment. Statements 11-13 aim to discover empathy provided by the employees of eLearning Services. This means how customized support eLearning Services and IT Service Desk provide to users. Lastly, statements 13-20 focus on tangibles related to VC services, which mean the interface design and logical structure of the services. Two more statements were separated from the previous ones i.e. question number 9, because they cannot be categorized into any of the dimensions.

The third part of the survey is devoted to collect empirical data about the tools utilized at Lapland UAS. This part of the questionnaire consists of 2 scale questions, 2 open-ended questions, 5 yes/no questions, a category, a quantity and a multiple choice question.

Finally, in the fourth part of the questionnaire 13 open-ended questions are stated. As these questions focus on the different virtual tools, they allow the researcher to collect quantitative data concerning the tools currently in use. Due to the fact that the questionnaire was available in Finnish language, in order to allow the researcher to understand the answers, some of the responses had to be translated to English language during the analysis.

The questionnaire was advertised through the school's e-mailing system. Furthermore, promotion of the survey was made on social media and posters were hung in the campus area to involve more participants in responding to the questionnaire. The survey was available for the duration of three weeks in February 2015. The questionnaire was sent to all students, teachers and staff members who are currently working at the university. This means 5618 students and around 560 employees in total (Lapland UAS 2015a). At the end of the survey availability period, 41 responses were collected through the English and 212 through the Finnish questionnaire, resulting in 253 responses in total.

3 VIRTUAL CAMPUS SERVICES IN HIGHER EDUCATION

The general idea and the conceptual understanding of VC services is defined in this chapter. The typical user classes, needs, expectations, values and use cases are analysed in relation to the service offering. The main attributes, characteristics of VC services are explained, the advantages and typical challenges are analysed. Additionally, it is analysed, what the purposes of VC services are and how they fulfil user needs and expectations.

3.1 Virtual Campuses

Education has changed rapidly during the 20th and the 21st century. As web-based technologies have started to become popular, several universities started to launch their first online environments, such as a standard university webpages and VLEs (Re Vica 2011). Soon, institutions started to provide several different kind of internal operations to students and teachers, i.e. pages collecting relevant study materials, and information or assignments for courses. Around 1997, the concept of VC gained attention. (Re ViCa 2011.)

The advent of digitalization has started to change educational processes. New tools and instruments were introduced in classrooms. Traditional, paper-based administration has started to disappear and to be replaced by electronic documents. The uniqueness of computer-based services is that they are intangible, virtual means. However, they are an essential part of everyday processes at universities in the present time.

By creating such environments, the concept of VC was introduced. Soon, VC services started to expand their functionality rapidly with e.g. learning environments, course management systems and software tools evaluating student performance, exams, online library services and joint courses to other campuses. The rapid growth and the popularity of technological solutions are influencing education to the extent that there are many study programs offered online in the form of distant education. (Re ViCa 2011.)

According to Fitzsimmons (2006, 106), technological improvements have reformed customers' expectations and service encounter. In the present time, technology plays an important role in the many services from both provider and consumer perspectives. Nevertheless, the modes how technology contributes to the service encounter are different (Fitzsimmons 2006, 106-108). Figure 1 displays the five typical ways of how technology can contribute to the service encounter (Fitzsimmons 2006, 106 citing Froehle & Roth 2004, 3).

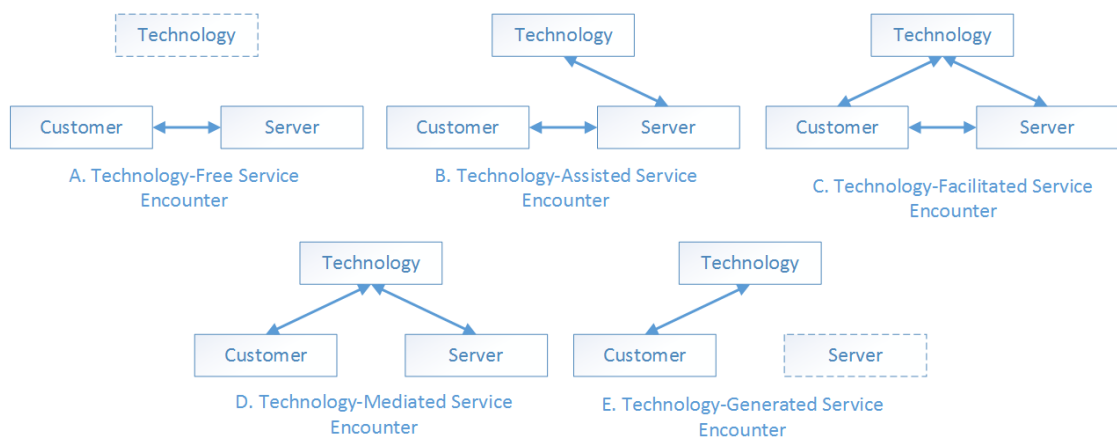


Figure 1. Roles of technology in service encounter (adopted from Fitzsimmons 2006, 106 citing Froehle & Roth 2004, 3)

According to Fitzsimmons (2006, 106-107), the first type of service is the classical, technology-free customer encounter (A), where no technology is involved. Technology-assisted (B) encounter involves technical tools from the service representative to improve the quality of a traditional, face-to-face experienced service. In case of technology-facilitated (C) customer contact, both customers and service providers access the same technology, but keep the way of communication face-to-face. Type D is called technology-mediated customer contact, because the consumer and provider are physically separated, and therefore the communication can be made only through technology. Finally, technology-generated (E) encounter does not involve any human service provider, since representatives are replaced with technology-based tools, which allow self-service. (Fitzsimmons 2006, 106-107).

VC services are fundamentally based on technology. According to the concept of Fitzsimmons (2006), VC services are typically technology-facilitated (C) services, because students and teachers meet and communicate in person, but in some cases they access the same technological tools. However, distant students and teachers experience the technology-mediated (D) behaviour of the VC service package as they interact mainly through virtual classrooms and online meetings. Furthermore, the technology-generated customer contact, i.e. self-service (E), can be encountered, for example when students look for information stored in the VC by themselves or when staff members make the administration procedures of students or lecturers.

Universities have different expectations and needs from this service offering. Nevertheless, almost every university utilizes VC services in some way. Defining the concept of VC services can be very subjective, and therefore it is rather hard to tell, what offerings a VC package includes. (Re ViCa 2011). There are several suggested definitions for the concept of VC services (The BENVIC Project 2002; Re ViCa 2011). The BENVIC Project (2002) defines the concept as “a specific format of distance education and on-line learning in which students, teaching staff and even university administrative and technical staff mainly 'meet' or communicate through technical links”. As a result, VC is a communication platform for the actors. According to Re ViCa (2011), the idea is approached from a boundary point of view. A conceptual representation of the boundary approach was introduced by the Re ViCa (2011) as shown in Figure 2. (Re ViCa 2011.)

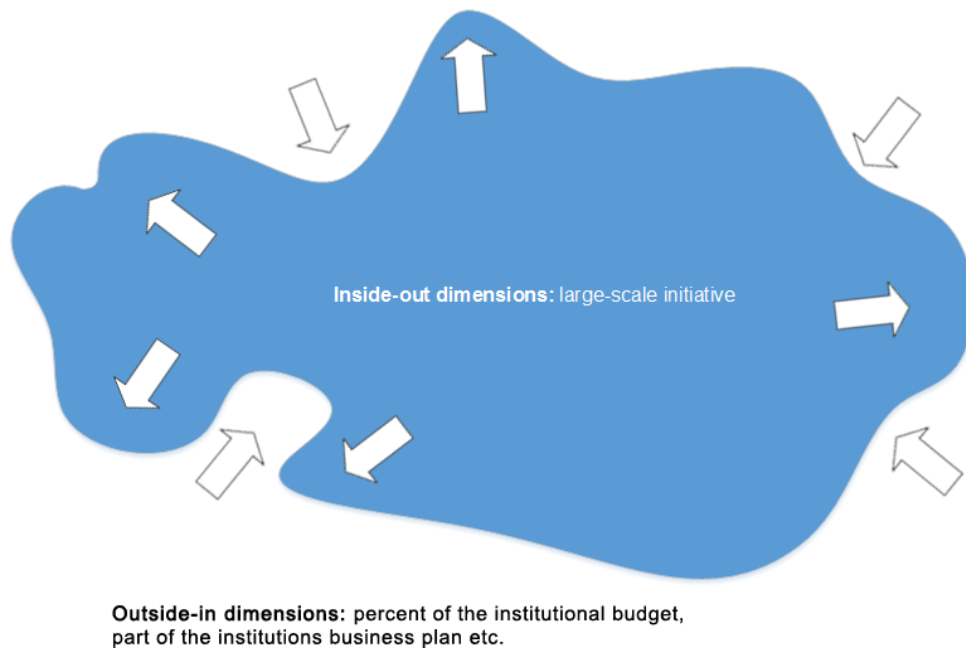


Figure 2. The boundary approach of VC concept (adopted from Re ViCa 2011)

As stated by Re ViCa (2011), the area covered by VC services is shaped and formalized uniquely by two opposing forces. The formalized needs and constraints result in a unique, amoeba-like shape for each organization. The inside-out dimensions represent the needs of the organization, such as the functional requirements and user expectations. The inside-out dimension extend the boundary. However, the outside-in dimensions are limitations, such as technology or institutional budget, which are drawing the borders for the VC service package. (Re ViCa 2011.)

This boundary approach is a great visual representation of the limited and demarcated attributes of the VC services, since universities have unique needs, expectations and different audience for their services. Consequently, the context, the target group and the institution's profile are determining the functionalities of VC services. (Re ViCa 2011.) For example, a university operating in IT field has a higher impact and workload on VC services in comparison others functioning in the field of health care. Students studying in the IT field require higher VC service quality as their field of study is fundamentally based on IT resources.

Service quality is a concept which has emerged in the past decades. Numerous definitions have been suggested in the literature for service quality (Shahin 2006, 2). In simple terms, service quality measures the difference between individuals' expectations from a service and their perceptions after taking the service (Shanin 2006, 2 citing Parasuraman, Zeithaml & Berry 1985). As stated by Fitzsimmons (2006, 128 citing Parasuraman, Zeithaml, & Berry 1985, 8) and represented in Figure 3, the perceived service quality is subjectively determined by the difference between the expected service and the perceived service.

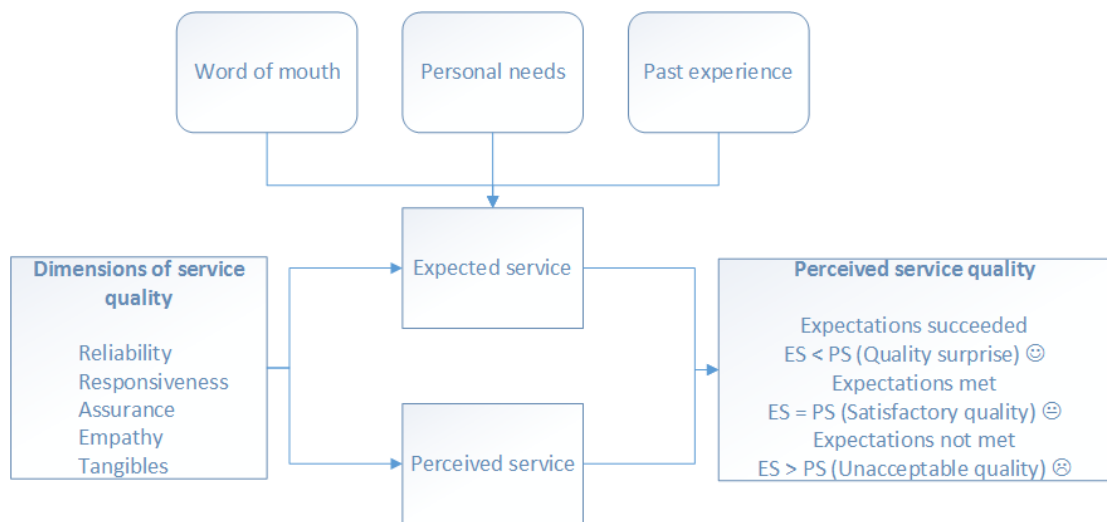


Figure 3. Perceived service quality (adopted from Fitzsimmons 2006, 128 citing Parasuraman, Zeithaml, & Berry 1985, 8)

The quality assessment is strongly based on the first impression and done during the service delivery process. Naturally, each customer expects certain level of quality and empathy from service providers based on personal needs, past experience and word of mouth about the service. During the service encounter, customers perceive the service in some way, which might not match their expectations. Customers have different needs, consequently the perception is unique and subjective. The perceived service quality is influenced by all the aspects described above and results in either quality surprise, satisfactory quality or unacceptable quality for each individual customer. (Fitzsimmons 2006, 128-131.) As a result, different customers require different care from the service provider.

To provide high quality VC services, it is important to understand how users use and what they expect from different tools (Shahin 2006, 1). One of the challenges is the wide variety of students. Universities typically offer degree programs conducted in the country's national language, however English programs gained popularity recently. By bringing foreigners to the classroom, all of the VC tools require English language support, furthermore different cultural backgrounds, aspects and communities are brought into consideration. The students learning distantly require different methods and approaches in teaching compared to face-to-face education. Beyond that, teachers and staff members expect different service operations, which facilitate their work procedures in an efficient way. Hence, the operations, everyday tasks, required technical skills and capabilities are also different for each user group. In sum, to provide high quality service and to guarantee the satisfaction, the specific needs, challenges and obstacles has to be identified and analysed during the service design.

3.2 Characteristics of Virtual Campus services

The goal of VC services is to facilitate rather than to render study procedures more difficult. As stated by the Lampinen and Hagström (2002, 10), "e-learning should be seen as a tool for improving face-to-face education, not to substitute it". VC services "should be considered and understood as a partnership with teaching and learning" (Lampinen & Hagström 2002, 4). Accordingly, VC is a technology-facilitated service, where all user groups can find information, perform their tasks on everyday basis and reach their destination as easily as possible. The environments are designed in accordance with the users' needs and use case scenarios, resulting in different, but only necessary selection of functions for individual user roles. VC consists of tools that support the study and administration processes, rather than creating obstacles, which cause confusion and problems for the users.

Communication is essential part of cooperation. The stakeholders of education, students and teachers, normally meet face-to-face, however every now and then

they use different online tools to exchange information. As stated by Dillenbourg, Schneider and Synteta (2002, 8), VC is an information and social space. Information systems enhance communication and the access to data such as study material. Through VC services users find, share and contribute to vital information. On the account of VC services, new access channels to information become available, which are often more convenient and comfortable for the users. VC is space, where actors communicate and cooperate with each other, not only in real-time, but using asynchronous communication methods, such as electronic mailing and forums. (Dillenbourg, Schneider & Synteta 2002, 5.) Last but not least, online services offer great possibilities to open new partnerships and virtual collaboration channels between institutions; therefore the wide popularity of virtual solutions is easy to understand (Re ViCa 2011).

Technology influences teaching, learning and administration processes. Universities apply VLEs to assist students' education and Index Management Systems to handle grades and administration procedures (Re ViCa 2011). Therefore, many stakeholders beyond students are involved somehow in the usage of these tools. By replacing the paper-based administration, electronic documents are easier to handle, recover and analyse. As a result, not only teaching, but administration is also made through VC services.

VC services offer a lot of flexibility and ease of access to electronic study materials (Jhosta 2015). If students miss a class, they can find all electronic materials at own convenience through virtual tools. This possibility is an essential factor for those, who are working on daily basis meanwhile studying at the university. VC services allow access to course materials online as well as distant learning. Virtual classrooms as parts of VC services offer a lot of flexibility and financial benefits, therefore distant learning is getting more and more popular in the present time. (Jhosta 2015).

In this thesis, VC contains all software solutions, IT tools and services that support educational and administrative processes in a university environment. VC services offer virtual space for students, including regular and distant students,

to support their administration procedures by allowing the communication with other stakeholders. VC services include the management of courses, exams, grades, study materials. VC is an environment for teachers to update curricula, study materials, to manage students participating in courses, to instruct distant students in virtual classrooms, to give assessment and feedback on homework, essays, theses and exams. Other supporting procedures of the institution related to studies, e.g. library services, student and staff mobility programs, practical training and alumni services are included in the service package. Furthermore, students and teachers might cooperate with other, external actors for research and development projects through the VC environment. Finally, all administration procedures such as evaluating new applicants, graduation process or technical support done by staff members of the university are considered as a part of the VC service offering in this thesis work.

3.3 Students

Students are the majority of users and main audience of VC services in higher educational institutions. As a matter of fact, the general idea and main objective of the service is to provide a platform and tools to support the study procedures of students (Pruikkonen & Nijbakker 2015a). Traditionally, students spend more time in the physical campus of the institution, since most of the lessons are conducted in classrooms. However, in the present time students cannot avoid using computer-based tools on the top of regular practices. Thereby, students' familiarity with VC services is indispensable independently from study field and place. Despite the fact that universities have different promises through the VC services, the most common tasks as displayed in Table 2 are essential for students in such environment.

Table 2. Most commonly used tools and accomplished tasks from students' point of view in the VC

| Tool | Services/Tasks |
|-----------------------|---|
| Course Management | Accessing curricula, course descriptions Signing up/cancelling courses Accessing study material <ul style="list-style-type: none"> • Specific, course-related material (teacher's presentations) • Other material (books, thesis works, scientific publications, articles) • Recordings of courses (in case of distant learning especially) Submitting/uploading coursework Reviewing teachers and courses after completion Looking for practical training placement |
| Index/Exam Management | Listing accomplished, pending, available and failed courses and exams Receiving grades for homework, exams and courses Signing up/cancelling exams Signing up for final examination |
| Communication Tools | E-mailing Internal chat Forums (e.g. class and alumni) |
| Timetabling | Accessing own timetables Accessing timetables of specific rooms, classes, teachers or other students |
| Supporting Services | Library services <ul style="list-style-type: none"> • Browsing and renting books • Extending due dates of rentals Virtual social space for organizing events Alumni services |

These offerings serve the needs of students related to studies explicitly and implicitly. Using Course Management Systems students actively participate in learning procedures and interact with teachers. They share, exchange and represent information in order to move forward in studies together (Lindholm 2015a). Through Index Management students can manage their study state by listing grades and results, as well as signing up for desired courses and exams. The administration procedures related to practical training and graduation could be handled in the same system. Different communication tools, such as e-mailing, internal messenger software or forums are devoted to enhance the flow of information between actors. Furthermore, through VC services students access their timetables, which provide them information about the placement and date of lessons. Finally, there are some typical supporting services, such as library, internal social networking and alumni services, which provide further possibilities of learning, cooperation and communication with other students, teachers or graduates. Consequently, the main expectation of students from VC services is an environment which facilitates their study procedures, i.e. by granting easy access to study materials, allowing to upload and store homework to a safe and secure environment and offering a simple to use communication channel with other stakeholders.

VC is a social space (Dillenbourg, Schneider & Synteta 2002, 8). VC is the first place of communication channel after face-to-face interaction for many actors. Many students prefer to talk to teachers personally. However, if a student is not able to find a lecturer in person or if they are physically separated, the only way of communication is electronic mailing system. Getting support from IT support personnel is typically done also through e-mailing system rather than face-to-face communication. Additionally, sharing study material is done through virtually rather than on printed copies in the present time. The material is typically uploaded by the teacher him/herself and the assignments are returned by the students online. Therefore, the contribution between students and instructors through the services is keen, because without them all environments would be empty and all

procedures would work in the traditional, paper-based way. (Dillenbourg, Schneider & Synteta 2002, 8-10). Consequently, the students must be able to take VC services at any time and the communication with others and the access to information must be reliable.

The amount of information stored in VC is enormous and its security is crucial. Students expect that their documents are stored in a secure environment. The consequences of lost documents and downtime of services could result in uncertainty. Thereby, VC services are expected to grant a feeling of trust to the users.

VC requires technical skills from users due to its technology-facilitated behaviour. Most of the students represent the younger generation, thus they have more knowledge how to use computers. However, depending on study field and previous background, the skills might differ. For instance those students, who are interested in health care, social services or business field do not have intention to use too much technology, if not necessary. Furthermore, usually universities deal with elder students as well, who regularly face more challenges of technology. Therefore, adult students have different needs and require special trainings to the usage of VC services. To ensure great user experience, the wide variety students, their backgrounds and prior skills must be reflected to in the service design. Throughout VC services, usability and understandability are key factors of consideration.

3.4 Remote/distant learning students

Distant education has gained popularity recently (Bolliger & Wasilik 2009, 1). The growing popularity of distant education is endorsed by Jhosta (2015) as he states that more adult students are turning towards distant education. The attractiveness of distant education amongst adults is easy to understand. In contrast to traditional colleges, distant learning offers great flexibility in study schedules, which is appreciated by adults, who usually work in full time jobs and take care of their families beyond studies (Jhosta 2015). Traditional ways of university studies do not offer too much flexibility, but online education grants a possibility for

personal time-management, which is a possible workaround to connect busy working life with studies. Furthermore, online degree programs offer a wide variety of choices to students, since students are not tied to one physical place. Students can select and participate in courses from any part of the world. Through VLEs it is possible to participate in special trainings online, which was possible only by changing physical location before the ages of the Internet. Additionally, from the school's point of view the cost of an online course is lower, because the expenses of the supporting facility, such as electricity or furniture, are relatively low in comparison to traditional practices. (Jhosta 2015.) Jäminki (2015), senior lecturer at Lapland UAS stated that most of students in distant education are adults with children who have busy schedules. "Therefore they have more motivation to learn, because most of them can connect their studies immediately to the working life" (Jäminki 2015). Consequently, the increasing popularity of distant learning is reasonable, but it raises many new challenges from the aspect of VC service design.

Studying in virtual classrooms has extended the challenges of teaching. Many elements influence satisfaction of students in case of distant education. (Bolliger & Wasilik 2009, 1-4.) As is shown in Figure 1, remote students and their teachers typically experience the technology-mediated (D) behaviour of the VC services. In the present time, classic face-to-face communication is disappearing. Regular practices are being replaced with virtual communication channels, which might result in slightly slower flow of information and fragile relationship between stakeholders. The consequences of delays and the possible malfunction of technology in urgent situations can be crucial. The role of VC services is to provide environment for virtual classrooms, where students and teachers can collaborate similarly to regular practices. To ensure the fluent learning process, the students must be introduced to the usage of these systems in advance through training sessions. (Bolliger & Wasilik 2009, 1-4.)

Distant education raises the issues of course management, course websites and administration. Since materials and records are handled in online environments,

students are unable to get printed study material. Therefore, the VC service design is expected to consistently follow simplicity and intuitive behaviour to allow users to perform tasks fluently. Furthermore, technical support has to be available to handle the questions raised and solve the problems of the audience. (Bolliger & Wasilik 2009, 1-4.) Accordingly, to satisfy needs of remote students, beyond the issues of regular students, the aspects described above is taken into consideration throughout the VC service design.

Active participation and honesty of students are other aspects raised by distant education. Generally, remote students listen to lectures in their homes, in comfortable environments. Besides, their busy schedules result in other duties beyond studies. Thereupon, there might be many potential factors of distraction which can cause a change in students' attitude to lectures, for example children running around. (Jhosta 2015.) However, lecturer Jäminki (2015) observes that "the motivation of adult students is really high" during online classes. The positive attitude often influences the motivation of regular students, who join adult group at Lapland UAS (Jäminki 2015). Furthermore, the evaluation of students is done mostly through virtual tools, which denies the original way of observation. Teachers can hardly tell, if a student is paying attention to a lesson or using external material during an exam, which is not allowed. One of the possible workarounds of this issue is, as Ryabov (2015) and Jäminki (2015) stated, is not to hold exams, but ask students for coursework for submission instead, which is evaluated in the "traditional" way.

In summary, remote students have more complicated scenarios of reaching their goals in today's higher education. The VC has to be designed in a way, to support and facilitate these aspects, ensure activeness and lively attitude of remote students.

3.5 Teachers

Teachers experience some parts of VC services similarly to students, however their goals are usually different. Lecturers use VC services to communicate not only with students, but with colleagues and external partners of the school, i.e. companies or other partner institutions. Consequently, teachers use the communication channels with more impact and responsibilities compared to students. (Dillenbourg, Schneider & Synteta 2002, 8.) VC services enhance Research and Development projects, thesis work processes and cooperation possibilities with external stakeholders, not only from students', but from instructors' point of view.

Teachers mainly use VC services to do their job. The goals of teachers essentially involve teaching, evaluation and grading of students' coursework. Therefore, teachers expect supporting functions for their lectures and courses (Ryabov, 2015). Through the tools of VC services presentations, articles and other study materials are shared, homework, essays are assessed, exams are held and evaluated by the teachers. Lessons given in virtual classrooms are embedded in an environment, where the instructors can simulate the atmosphere of regular lectures and allow students to interact the same way as they would do in a normal classroom environment (Dillenbourg, Schneider & Synteta 2002, 8). Virtual classrooms and tools are not barriers, but different methods to enrich personal teaching and learning styles (Pruikkonen & Nijbakker 2015a). Therefore, VC infrastructure is prepared to store, handle media content and the easily deal with high data traffic.

Technical issues should not discourage teachers from doing their job online either. Typically, preparation for an online course takes more time and effort for teacher. Setting up the equipment, including hardware and software, and the course environments takes more effort compared to regular lectures. Consequently, lecturers should be ready to perform their tasks without any problems in virtual environments as well as regular classrooms, which can be guaranteed through prior trainings. The greatest challenge is to ensure the motivation of

teachers to use virtual solutions, especially in cases, when the instructor's interest field and expertise are far from the IT field. Additionally, the technical challenges faced by the elder generation are taken into consideration. Consequently, VC services are intuitive, easily understandable and usable from teachers' aspect as well. In the end instructors feel comfortable with VC services. Nevertheless, the skills and availability of technical support is ready on demand to resolve difficulties.

Virtual classrooms raise the difficulty of the disappearance of face-to-face interaction, which can be crucial from instructors' viewpoint. In online lectures, the professor cannot see the facial expressions, the attitude and even the presence of students. However, on "traditional" lectures, many experienced speakers can react to the attitude of the audience, which is more or less impossible on webinars. Therefore, participation in virtual lessons might be uncomfortable for some teachers, which also is taken into account. Many teachers like to see which students are active during their course. Thanks to technological assets, user interactions can be tracked easily. Statistical tools tracking students' activity in the VC services are considerable for instructors, which can represent the interactions of participants, such as last visit date on the course page, time spent with filling an exam sheet or homework etc.

3.6 Staff members

Staff members are the last, but still significant stakeholders of VC. Similarly to instructors, university employees require environment to accomplish their everyday work procedures. For this reason, VC as a key channel of communication for university staff members as well (Dillenbourg, Schneider & Synteta 2002).

Employees have specific tasks to support studies of students and to assist teachers in their job through various background procedures. The procedures done by secretaries and librarians involve mostly administration, e.g. handling new applicants to the school, administration of exchange programs, practical

training or process of graduation. Staff members also include IT support personnel, whose duty is to resolve technical issues related to studies and lectures, e.g. technical support about e-learning services. To guarantee the information and process flow, employees should be able to access the modules and tools according to their own responsibilities. Naturally, these tools have to be designed in accordance to usability and understandability, to guarantee the fluent administration and resolution of issues. Each employee should feel confident about and clearly understand the systems they are working with. In order to support employees' work procedures, beyond initial trainings, manuals and "how-to use" documentations could be prepared for the most common tasks and applications.

VC service design has to reflect on the variety of staff members. Elder employees might not be familiar in the usage of computers and virtual solutions, therefore the lack of interest can be a relevant issue. Therefore, the functionalities have to be simple and understandable for staff members in order to avoid troubles through their usage. Nevertheless, if any technical problems appear, the information systems and technical support are ready to provide help to get over the obstacles.

3.7 Summary

The rapid growth of technology has a great impact on today's world. Web technologies have influenced many fields of public sector, including education. During the past decades VC services appeared at many universities all over the world to enhance the communication, teaching and learning procedures at institutions operating in higher education. VC services are used broadly all around the world. However, there is no understanding about the concept of VC services and there are various expectations stated for the service. Defining the theoretical concept and considering the goals and challenges faced by different typical user groups enabled to reveal many important aspects in the design of VC services.

The popularity of VC services amongst universities is undoubted. However, each institution have different needs and expectations from the service. As it was displayed in Figure 2 (Re ViCa 2011), the area covered by the services is formulated by two opposing forces uniquely at each institution. Generally, VC services are used as a communication and information sharing channel for the stakeholders involved, which is typically realized through technology-assisted or technology mediated service encounter (Figure 1, Fitzsimmons 2006, 106). After all, VC services should be seen as tools to enhance education rather than to raise difficulties and obstacles to users (Pruikkonen & Nijbakker 2015a; Ryabov 2015).

Four typical user classes with different needs and expectations are involved in VC services. The analysis of typical user needs and tasks performed in virtual environments enables to understand the functional and non-functional requirements of the VC service package. The design of a logical structure, intuitive interface and simple functionality can ensure the understandability and boost the motivation of users to use computer-based tools for learning and administration procedures. Furthermore, these aspects enable users to get used to the systems and access information easily, which are expected properties of such crucial work tools. As VC is an environment of communication and information sharing, the ease of access, security and reliability are relevant issues to take into account, and the possible malfunction can make huge impact on users' experience.

4 SERVICE-DOMINANT LOGIC

A short overview of the fundamental shift in worldview called Service-Dominant Logic (hereinafter SDL) is presented in this chapter. In the first section of this chapter the main reasons, goals, aspects, principles of SDL are described and explained. The second section applies the fundamentals of SDL in relation to VC services and describes the VC service package according to ideologies of SDL.

This chapter is based on the overview of relevant literature and the interview with enterprise architect Lindholm (2015a). As an employee and former student of the case institution, the enterprise architect Lindholm (2015b) conducted research concerning the institution's organizational structure and IT service ecosystem. Therefore, the expertise and findings of Lindholm (2015a, 2015b) essentially contribute to the present study and assist the researcher to gain more understanding about the insights of SDL and the culture of the organization.

4.1 Introduction to Service-Dominant Logic

The modern world has gone through changes during the past centuries from many aspects. The fundamentals of the 20th and 21st century has created new worldviews and approaches. The visible marks left by the change influence not only the field of technology or education, but the marketing and business sphere as well (Vargo & Lusch 2004, 1). In contrast to the product-oriented worldview of the industrial revolution, today's business world talks about services. The value creation is made by exchange of services between firms rather than production of goods. The product, as tangible outcome itself turned not to be the subject of business transactions anymore, rather than the process of service exchange and relationships between provider and customer are significant. (Vargo & Lusch 2004, 1-2.)

At the end of the 20th century humanity started to realize that skills and knowledge has begun to be more valuable than products provided by the industry (Vargo &

Lusch 2004, 1). According to Penrose (1959, 24-25), resources are tools for services, rendered by the service itself, which means that the resources are supposed to serve the needs of the business, but knowledge must be applied in order to process them. Thereby, firms start to provide a whole service package to the customer, rather than raw products (Penrose 1959, 24-25). This discovery resulted in the distinction between product and service (Vargo & Lusch 2004, 2). Products are only means, units of output that are sometimes used in the value creation process. The term of service started to emerge soon by several economists, a fundamental shift was started in the society (Vargo & Lusch 2004, 1). Service is a process of value generation which serves needs and increases the benefits of all stakeholders of the process through different set of activities. (Vargo & Lusch 2004; Lusch, Vargo & O'Brien 2007, 2.) Therefore, the market started to be more customer-oriented, the needs and values of individuals are considered more intensively compared to the manufactural production previously (Lusch, Vargo & O'Brien 2007, 2).

The firm-centric, manufactural Goods-Dominant Logic (hereinafter GDL) turned to be outdated. Organizations do not necessarily offer products anymore, but value propositions for services, which often results in an intangible experience (Vargo & Lusch 2004, 15). For example, going to the cinema has no tangible results from the customers' point of view, only a nice experience and memory about the movie they watched. According to Vargo and Lusch (2004, 10), enterprises offer value propositions, meanwhile customers expect benefits from the service. Accordingly, satisfaction can be ensured only by customer-oriented thinking, by understanding and serving their specific needs in advance. Organizations make unique value propositions for individuals, in many cases by offering personalized service (Vargo & Lusch 2004, 8). Service providers identify functional processes of the offering, analyse customer groups, their specific needs, expectations and analyse how the cooperative value co-creation is possible. The application of skills and knowledge from the service provider's point of view is key to success and competitive market potential. (Vargo & Lusch 2004, 9.)

SDL is the fundamental shift in the worldview from GDL, which was originally introduced by Vargo and Lusch (2004). SDL has developed through various publications in the recent years (Vargo & Lusch 2006, 2008a, 2008b, 2008c; Lusch, Vargo & O'Brien 2007). Initially SDL consisted of 8, and later it was extended with 2 more Foundational Premises (hereinafter FPs) as displayed in Table 3 (Vargo & Lusch 2008a, 7).

According to the principles of SDL, organizations, markets and the whole society are vitally concerned with exchange of service (FP1). In the text to follow, the abbreviation FP with a number refers to the Foundational Premises presented in Table 3. Service exchange is a process of value-generation, an increase in the benefits of all parties involved in the service process. All firms are service-oriented firms and markets are centred on the process of service exchange (FP5). SDL embraces concepts of the value-in-use and co-creation of value rather than the value-in-exchange and embedded-value concepts of GDL. In accordance to SDL concept, information and knowledge are key factors to success to gain competitive advantage on the market. Competences are applied through the service process for the benefit of all actors, who are involved in the process. (Vargo & Lusch 2008a, 6; Lindholm 2015a.) Six differences are stated by Vargo and Lusch (2004, 7) between GDL and SDL, involving primary unit of exchange, role of goods, role of customer, determination and meaning of value, firm-customer interaction and source of economic growth.

Table 3. Foundational Premises of Service-Dominant Logic (adopted from Vargo & Lusch 2008a, 7)

| FP # | Foundational premise | Comment/explanation |
|-------------|---|---|
| FP1 | Service is the fundamental basis of exchange | The application of operant resources (knowledge and skills), “service,” as defined in S-D logic, is the basis for all exchange. Service is exchanged for service |
| FP2 | Indirect exchange masks the fundamental basis of exchange | Because service is provided through complex combinations of goods, money, and institutions, the service basis of exchange is not always apparent |
| FP3 | Goods are a distribution mechanism for service provision | Goods (both durable and non-durable) derive their value through use – the service they provide |
| FP4 | Operant resources are the fundamental source of competitive advantage | The comparative ability to cause desired change drives competition |
| FP5 | All economies are service economies | Service (singular) is only now becoming more apparent with increased specialization and outsourcing |
| FP6 | The customer is always a cocreator of value | Implies value creation is interactional |
| FP7 | The enterprise cannot deliver value, but only offer value propositions | Enterprises can offer their applied resources for value creation and collaboratively (interactively) create value following acceptance of value propositions, but can not create and/or deliver value independently |
| FP8 | A service-centered view is inherently customer oriented and relational | Because service is defined in terms of customer-determined benefit and co-created it is inherently customer oriented and relational |
| FP9 | All social and economic actors are resource integrators | Implies the context of value creation is networks of networks |
| FP10 | Value is always uniquely and phenomenologically determined by the beneficiary | Value is idiosyncratic, experiential, contextual, and meaning laden |

The distinction between operand and operant resources was introduced by Vargo and Lusch (2004, 2 citing Constantin & Lusch 1994), which is also considered as basic concept of SDL. In simple terms, operand resources are tangible means, products or equipment, which support the process of value co-creation. In order to produce the outcome of a service, actions are performed on operand resources, which require the actors to apply their operant resources to produce the desired effect. Operant resources are the intangible skills, knowledge, competences or practices how to perform a particular action. Operant resources consist of pieces of information and applied as intelligence, thus they are essential factors to provide competitive advantage for the organization (as defined by FP4). (Vargo & Lusch 2004; 2008a; Lusch, Vargo & O'Brien 2007; Lindholm 2015a.)

In order to create value and satisfy needs of stakeholders, operant resources must be applied on operand resources. To ensure satisfaction, the customer is actively involved in the value creation process through direct or indirect mechanisms of service provision (Lindholm 2015a). Therefore, customers are essential part of the value creation process, since they are co-creating value together with the service provider directly or indirectly (FP6, FP8). Furthermore, since every stakeholder has specific, customized needs, the value can be determined only by the beneficiary at the moment, when the service is experienced (FP10). (Vargo & Lusch 2004; 2008a.)

The specialization of firms and the application of the unique knowledge forms the basis of today's service-oriented world (Vargo & Lusch, 2004, 6). Additionally, the specialization of individual departments inside an organization and the sharing of expertise is essential for value co-creation (Haukkamaa, Yliräisänen-Seppänen & Timonen 2015, 6; Vargo & Lusch 2004, 6; Lindholm 2015a). This way of thinking guarantees a higher level of outcome and customer satisfaction. To enhance the well-being of the whole organization, all stakeholders contribute to the value creation process. Organizations need to identify the changes, uprising needs and new ideologies of the society, keep up to date and adapt to the new trends by

continuously designing customer-oriented services and reviewing the traditional methods of the business. (Vargo & Lusch 2004, 6-8.)

The rapid technical growth has to be followed by each organization in order to gain market potential. This is a very challenging task, especially for organizations operating in the public sector. Public organizations, such as hospitals and universities can be extremely complex, include many operations to keep up their everyday procedures, which involves many operant and operand resources. In the following section, the aspects described above are applied to the concept of VC services.

4.2 Service-Dominant Logic in Virtual Campuses

SDL can be put in relation to VC services in order to see the service through a different lens. As enterprise architect Lindholm (2015a) pointed out, VC services are the processes, in which teachers and employees of the university indicate their operant resources to assist the study procedures of students through software components. According to the principles of SDL, software itself cannot create value to the users. Consequently, software modules as individual information systems are operand resources, and therefore only means or assets. With appropriate application of operant resources (skills and knowledge), individual items will start to provide values. This means, each part of the VC package should be not only software, but application to the users. Software items are used to enhance the well-being and fulfil needs through the usage by the application of the users' operant resources. From the point of view of SDL, the software components are indirect mechanisms, meanwhile the skills of employees are direct mechanisms of service provision. This means, users of VC services can perceive values through the use of the components indirectly, or through the expertise of eLearning Centre employees directly. Therefore, the value co-creation is a combination of the skills of users and the expertise of employees who are interacting with each other through the different information systems. (Lindholm 2015a.)

Service-oriented thinking is not followed by customers and service providers naturally (Vargo & Lusch 2004, 2008a; Lindholm 2015a, 2015b). When students have the experience that a software tool improves their well-being related to studies, they will appreciate the value of that particular item. However, they experience the whole package as described above. (Lindholm 2015a.) As Lindholm (2015a) emphasised, users follow the GDL approach in general, because it is closer to their way of thinking, it is “built-in” their worldview. However, SDL states that these items are indirect mechanisms, therefore only means or assets used to provision service. Consequently, without the operant resources of the eLearning Centre and the users, software tools are not valuable, they must be supported by operant resources in the usage. Rather than the individual components, the whole package should be appreciated by end-users. (Lindholm 2015a.)

Teachers and employees of eLearning Centre are actors, who prepare the operand resources with a purpose to enhance well-being of the students. Teachers prepare and share study materials, in many cases keep the lectures through virtual classrooms, which aims to improve the well-being of students. Ultimately, e-learning employees utilize operant resources by offering support to students if any obstacles appear during the use of VC services. (Lindholm 2015a.) The IT personnel prepare the hardware resources, preconfigure software, create the students’ identities, organize trainings etc. After the preparation phase, users are trained how to access and use the different tools in the VC service package.

The value co-creation is a result of undefined amount of various resource integration and service-for-service exchange (Vargo & Lusch 2004, 2008a; Lindholm 2015a). Lindholm (2015b, 37) emphasizes that businesses and customers are resource integrators in case of IT-related functions, which include VC services. Therefore, the operand resources of VC must be designed accordingly to the purposes of actors to allow the efficient application of operant resources and support the value co-creation process of all actors.

The first experience about the service has high impact (Fitzsimmons 2006, 131). Freshmen come to universities year by year. Therefore, it is important to keep in

mind that newcomers already have some prior knowledge as potential resources, which can be turned into value-creating resources. The VC should be designed in a way that each user could utilize his/her own, existing knowledge already at the first encounter and turn the potential resources to value-creating resources immediately. (Lindholm 2015a.)

The optimization of operand resources is important aspect of SDL. The organization needs to understand how users interact with the systems and exactly what the system should be able to perform. Hereby, the functionality and the utilized operand resources can be optimized accordingly to the needs. For example, a computer which is used for video editing at the university should have more powerful hardware resources in comparison to those workstations, which are used for browsing the web. This way the resource density and resource integration will be optimized, meanwhile the needs will be fulfilled. (Lindholm 2015a.) As Lindholm (2015a) points out, to guarantee optimal resource density, the operand resources, hardware and infrastructure, must be optimized. To ensure optimal resource density, the actors responsible for the maintenance have to understand, how the resources are used. Consequently, the understanding the goals and interactions of individual stakeholders is key factor to proper service design. (Lindholm 2015a.)

VC is a service, but there are no typical customers related to the offering. As Lindholm (2015a; 2015b, 40) states, actors can be defined, who interact with each other through the usage of the information system. According to Lindholm (2015b, 40 citing Lusch & Vargo 2014, 56) "Actors are entities that act purposefully within limitations, such as norms, traditions and attitudes". The actors of VC services are eLearning Centre employees as service providers and students, teachers and staff members as customers. To create a proper VC service design it is important to understand:

- What are the goals of different actors?
- What resources do users integrate in order to co-create value with others?
- What is the purpose of using the systems?
- How the ecosystem enhances their well-being of users? (Lindholm 2015a.)

Students are the main beneficiaries of VC services. Therefore, they are the only audience who can tell, if VC services (either provisioned directly or indirectly) are valuable for them. Beyond the well-being of the technical assets and settings, the individual components have to serve the users' expectations. Software components are expected to provide values on demand, at the right time and right place. To ensure satisfaction and value co-creation, all intended beneficiaries, but especially students should be involved in the design of the VC services. The service providers responsible for VC services has to cooperatively work together with the beneficiaries from the beginning, in order to maximize the value co-creation, resource density and level of satisfaction. (Lindholm 2015a.)

In summary, the application of SDL to VC services allows to observe the service from a different point of view. Each stakeholder, as actor of the value co-creation process, is expected utilize specialized skills and knowledge in order to enhance the well-being of others (Vargo & Lusch 2004; Lindholm 2015a). The goal of VC services is to assist education and enhance study procedures. As a result, the service focuses on serving students' needs in the first place (Pruikkonen & Nijbakker 2015a; Lindholm 2015a). To ensure that students perceive the values they expect through the VC services, they should be involved in the service design and value co-creation directly (Lindholm 2015a). Last but not least, from time to time the satisfaction of the users should be discovered to see, if the service package is designed reasonably, according to the expectations. In the end, each tool and device of the VC should mean not only software or hardware, but value-creating application and resource to the intended beneficiary (Lindholm 2015a).

5 ANALYSIS OF VIRTUAL CAMPUS SERVICES AT LAPLAND UAS

The analysis of the empirical data concerning VC services at Lapland UAS is presented in this chapter. This chapter is divided into five sections. The first section introduces the current VC service package used by Lapland UAS. The second section presents the general analysis of the data collected from user groups including the SERVQUAL analysis. Further, the following sections analyse the answers from different user groups, students, teachers and staff members correspondingly.

Due to the fact that the questionnaire aimed to discover and analyse many aspects concerning VC services at Lapland UAS, the amount of collected information is enormous. However, only the most important findings and diagrams are being presented, described and critically analysed in the following sections. The rest of empirical data have been presented and discussed with the commissioner of this thesis work.

5.1 Virtual Campus service package of Lapland UAS

In the organizational structure of Lapland UAS IT Service Desk (IT-palvelut) and eLearning Service Centre (eOppimispalvelut) are separate departments. On one hand, IT Service Desk is responsible for the maintenance of hardware resources and the network infrastructure. Furthermore, IT Service Desk grants users access for users to the information systems. On the other hand, eLearning Centre employees mainly grant trainings and support to users about the usage of VLEs and different online tools. When users experience difficulties about VC services as described in chapter 3, the support is typically retrieved through eLearning Service Centre. Therefore, the employees of eLearning Service Centre are the main connection point for users to get support about the tools in Lapland UAS.

Lapland UAS utilizes several tools for the most typical VC service functions through different environments. Table 4 displays the tools, their purposes and intended beneficiaries utilized amongst the VC services of Lapland UAS.

Table 4. List of VC tools, their purposes and intended beneficiaries utilized at Lapland UAS

| Tool | Purposes | Intended beneficiaries |
|----------------------------------|---|--|
| University website | Standard platform for sharing information about studies, news, public documents, organizational structure, contact information etc. | Students Teachers Staff members Public audience |
| E-mailing (Microsoft Office 365) | Official communication channel between stakeholders involved in VC services | Students Teachers Staff members |
| SoleOPS | Academic year, study and curricula and resource planning, course and exam enrolment, sharing of course descriptions | Students Teachers Staff members |
| SoleMove | Administration of international mobility programs | Students Teachers Staff members |
| WinhaWille | Interface for Index Management System. Recording and handling students' grades. | Students Teachers Staff members |
| TimeEdit | Timetabling software | Students Teachers Staff members |
| Moodle | Virtual learning platform, information space for sharing study material and returning coursework, space for examinations and students' evaluation | Students Teachers |
| Optima | Virtual learning platform, information space for sharing study material and returning coursework (being replaced by Moodle currently) | Students Teachers |
| iLinc | Tool for virtual classrooms, distant learning, web collaboration and online meetings | Students Teachers |
| Online library | Library services, renting and extending material, browsing established resources. | Students Teachers Staff members |
| Mahara | E-portfolio and collaborative work tool integrated with Moodle | Students Teachers |
| Lapinkampus Blog | Blog environment for courses, projects and general public information sharing platform | Students Teachers Staff members Public audience |
| Lapinkampus Wiki | Joint development of project documentation | Students Teachers Staff members Public audience |

The tools displayed above in Table 4 are essential parts of the VC service package. As some tools do not require more explanation, only the most important ones are explained in the text to follow. The university website serves as a main source of information for students, teachers, staff members and public audience, such as partner schools and prospective applicants. Lapland UAS provides standard e-mailing platform built upon Microsoft Office 365 technology to students. Teachers and staff members use Microsoft-based platform for e-mailing as well, however their electronic mailboxes are stored on the school's server computers rather than cloud services. According to school rules, e-mailing is the official channel of communication. SoleOPS is a web-based environment used by students to find course descriptions, curricula as well as to enrol to courses and exams. Additionally, students can give course feedback and plan their academic years. Teachers use SoleOPS to fill course descriptions. Moodle is a complex open-source VLE, where teachers share access study material for students. Moodle also offers space for electronic examinations, homework submission and evaluation. Optima is a similar VLE, which was used by Rovaniemi University of Applied Sciences before the merger of the two institutions on 1 January 2014 (Lapland UAS 2015b). Since the merger, Optima is replaced by Moodle, nevertheless some courses are still available in Optima's environments. Mahara is an online portfolio software integrated to Moodle, which assists students to create personal résumés. Mahara enhances collaborative working by shared pages for a group of people.

Another main component utilized at Lapland UAS is the Microsoft Active Directory (hereinafter AD), which is maintained by IT Service Desk. AD handles the user identities, authentication, user rights, configuration and privacy for the domain of Lapland UAS. Most of the components of the Lapland UAS VC displayed in Table 4 require user authentication. The AD plays a key role, because many identity authorization processes are done through the AD database, in order to allow users to use the same credentials to access individual systems. Each user of Lapland UAS has a unique username in the LUC domain, which is stored in the AD. Most of the tools displayed in Table 4 use the AD authentication to grant access

for users to the information systems. From users' point of view, this way of authentication results in easiness, because they are required to remember only one verified credential. Nevertheless some tools, for instance iLinc, use separate database for authentication, which can lead to confusion.

5.2 General observations

Lapland UAS is a relatively new organization (Lindholm 2015a; Pruikkonen 2015a). Before the merger of the two institutions, different tools were utilized for the same purposes separately in the campuses, for instance Moodle and Optima. The merger required changes in the organization's structure as well as tools utilized in the VC package. As enterprise architect Lindholm (2015a) highlighted, "this organization is very new, required collaboration channels or interconnections have not yet been structured". This observation is endorsed by the Pruikkonen (2015a), Head of eLearning Services as she highlighted, the development of VC services "has not started yet, because we are a new organization". According to eLearning developer Nijbakker (2015a), the practices are still under development from an approach where VC is not only a website, but an environment, where people find the shortest possible path to their destination. The development of VC services has already started "in a very user-centric way" as several departments were already contacted by eLearning Services, but the research did not involve students yet (Pruikkonen 2015a). Therefore, employees of eLearning Services are interested in students' experience about the tools currently in use.

Using the SEVQUAL methodology, the gaps in service quality were discovered amongst users of VC services. Figure 4 illustrates the service quality gaps for each statement of questions 7-8 of the questionnaire (Appendices 1 & 2).

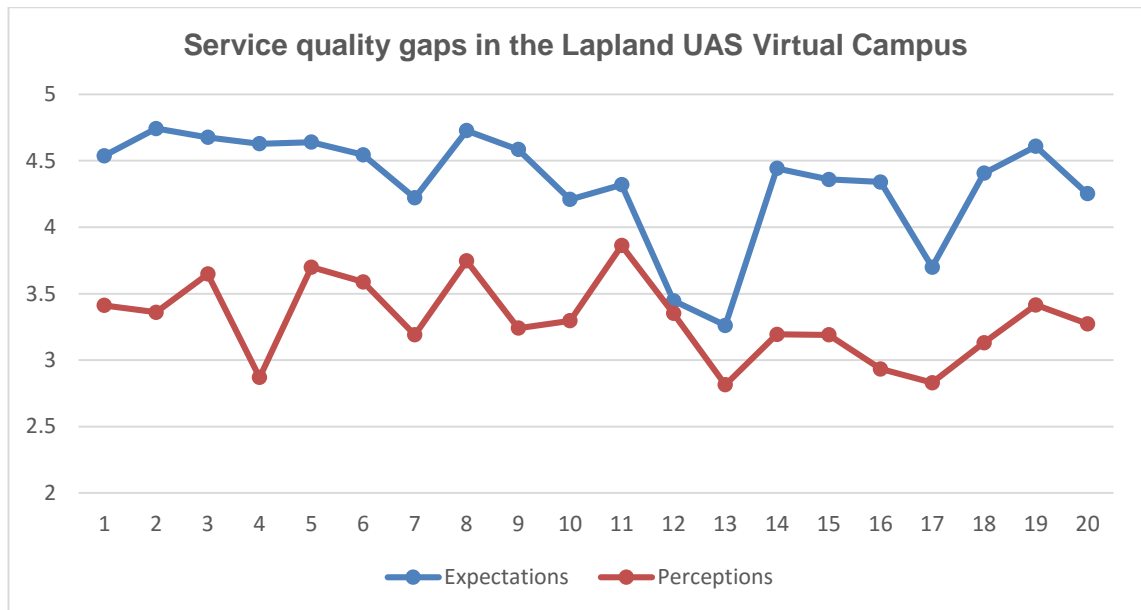


Figure 4. Service quality gaps between users' expectations and perceptions in the Lapland UAS VC services

As it is shown in Figure 4, the VC does not meet the users' expectations on a general level. Firstly, the biggest gap is in statement 4, which indicates that users can hardly find instructions and manuals about the usage of the tools. A possible explanation for this observation is the relatively young age of the organization. Some features were combined or cut off during the merger of the previous institutions, and therefore processes are not yet documented and structured. Additionally, creating and reading the documentation consumes a lot of time and resources, and therefore more trainings are provided in the usage of VC services instead of written material. However, there is written documentation available for many of the tools in Finnish and English languages (Lapland University Consortium 2015). However, seemingly users might not know about the presence of the documents, or they are not motivated to read them.

The small gap in statements 11-12 provide evidence that the expertise of IT and eLearning Service employees matches the expectations of users. This indicates a good feedback on the support and politeness offered by eLearning Services and IT Service Desk. In other statements, the gap is around 1 point, which is not

too bad, but something to analyse. Table 5 demonstrates the results the SERVQUAL analysis of Lapland UAS VC services.

Table 5. SERVQUAL scores for VC service quality gap analysis

| Dimension | Expectations | Perceptions | Gap Scores | Weightings | Weighted average |
|----------------|--------------|-------------|------------|------------|------------------|
| Reliability | 4.65 | 3.47 | -1.18 | 0.15 | -0.18 |
| Assurance | 4.51 | 3.43 | -1.08 | 0.15 | -0.16 |
| Tangibles | 4.17 | 3.1 | -1.07 | 0.4 | -0.43 |
| Empathy | 3.88 | 3.61 | -0.27 | 0.1 | -0.03 |
| Responsiveness | 4.51 | 3.34 | -1.17 | 0.2 | -0.23 |

**Overall
SERVQUAL
score: -1.03**

According to the expectation scores, users require reliability with the biggest impact from the VC services. Users expect the systems to facilitate the tasks to be performed at any time. However, the gap score of -1.18 points of reliability leads to the conclusion that users are often confused about or do not rely on VC services of Lapland UAS in general. The wide gap of reliability can be explained with the many different third-party tools. Most of the tools are not owned by the university, but they are third-party applications. Therefore, the customization and improvement possibilities are limited. Since the tools are from different service providers, the user interfaces and information structures are different. Some users do not have too much experience about the tools, and therefore they might not be confident about the usage of the services. As new students come year-by-year to the university, most of them experience these services in freshmen year at the first time.

Some of the tools are old-fashioned, as principal lecturer Ryabov (2015) points out in that “the interface of Winha is from the last century”. The old-fashioned, hard to use interface can be another reason for losing confidence and causing confusion. It is important to mention that the interfaces of Winha used by students

and teachers are different, which result in different user experiences. While teachers use WinhaPro, which is a desktop application, students use the web-interface called WinhaWille. Naturally, the graphical user interfaces and functionalities of these tools are different, however the results show that both user group experience difficulties because of the old-fashioned interface of these tools.

The relatively low importance from empathy means that users do not expect too much customized care from eLearning Services. Nevertheless, the support from eLearning employees has attested well, which is proved with the narrow gap score of empathy. As shown in Table 5, an overall weighted SERVQUAL score -1.03 was recorded, which indicates unsuccessful meeting of users' expectations across all service areas. However, the results are not disappointing, the overall score is not too bad, but there is space and need for improvement.

The satisfaction of different groups are vary. Table 6 displays the overall level of user satisfaction. The represented data is based on the answers collected on question 21 of the questionnaire (Appendices 1 & 2).

Table 6. The observed distribution of answers about overall user satisfaction

| | Not satisfied at all | Somewhat dissatisfied | Satisfied | Very satisfied | Highly satisfied | Overall |
|---------------------|-----------------------------|------------------------------|------------------|-----------------------|-------------------------|----------------|
| Student | 1 | 47 | 100 | 8 | 44 | 200 |
| Teacher | 0 | 16 | 11 | 1 | 8 | 36 |
| Staff member | 0 | 11 | 3 | 0 | 3 | 17 |

As is demonstrated in Table 6, students tend to be more satisfied regarding the services. A possible explanation for students' higher satisfaction is their narrow view on the services. Students do use the tools as long in time as teachers and staff members do. Students most typically use tools for study procedures for couple of years until they graduate. In comparison to the teachers and the staff members who work over 5-10 years at the university, students use VC services on a basic level. When answering to this question users might think about the services,

they use on a regular basis and omit the rest of the tools. Because of students use only a smaller portion of tools, they tend to be more satisfied compared to the rest of users. The teachers and the staff members gathered more experience and probably encountered more issues about the services, therefore they tend to express more dissatisfaction. Users belong to different groups in role, age, culture and knowledge. As a result, their purposes and level of satisfaction is different as well.

Based on the empirical data analysis, the number of tools is too high. Respondents of the questionnaire share this opinion, as they stated that “there should be fewer applications in use, as multiple applications cause confusion”. A respondent highlighted that there are “too many different systems... Their number is growing every year”. The many different tools and the ongoing development of information structure is an indicator of users’ dissatisfaction.

The operant resources of eLearning employees utilized for direct service provision are satisfactory. The scores for assurance, tangibles and responsiveness are equal, which show similar differences between expectations and perceptions. According to Burik (2015) and Klimenko (2015), most of the students can easily utilize their prior operant resources, as they learn how to use the services in a few weeks after the first encounter. Therefore, the trainings organized by eLearning Centre during the orientation weeks are well designed and effective. Additionally, the existing knowledge and potential operant resources of new students prove to be useful to learn to use services utilized at Lapland UAS.

5.3 Students

Students as the majority of users are the majority of respondents for the questionnaire as well. A total number of 200 answers from students were collected through the questionnaire. Since students are the main beneficiaries, their opinion have high impact on the analysis. As it is listed in Table 4, there are many different tools aiming to assist studies. Figure 5 illustrates how often the listed tools are used by students based on the answers to question 10.

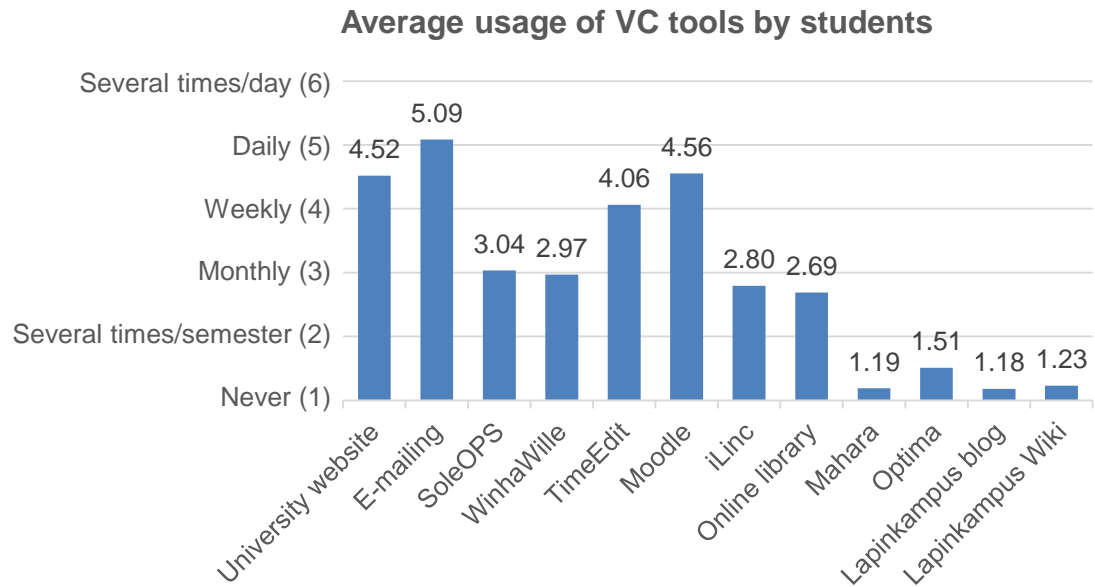


Figure 5. Average usage of VC tools by students

As shown above, e-mailing, university website and Moodle are crucial tools for students to keep in touch with others and to get up-to-date information about studies. Therefore, they take these services every day. TimeEdit is also an essential tool for students as they check their weekly schedules. Students visit SoleOPS, WinhaWille and iLinc only monthly. These results are reasonable, since students do not receive marks every week and most of students do not have online lectures on iLinc.

Mahara, Optima, Lapinkampus blog and Wiki are used rarely. Most of the students do not even know about the last four services, as many of them replied “What is it?” or “Never heard about it”. Seemingly these services are not popular amongst students, probably because they do not offer too much information and values for them. The relatively low usage of Optima can be explained with the tool’s replacement by Moodle after the merger of the universities. However, the Online Library is not visited too often by students.

Online library is one of the most important tool to facilitate the study procedures, but many students do not use and they are not satisfied with this tool. Amongst

others, full-time student Klimenko (2015) has problems with the Online Library, as “it is really difficult to find established sources, books, scientific articles and thesis works”. Figure 6 displays the students’ average satisfaction with the tools based on the replies to question 12.

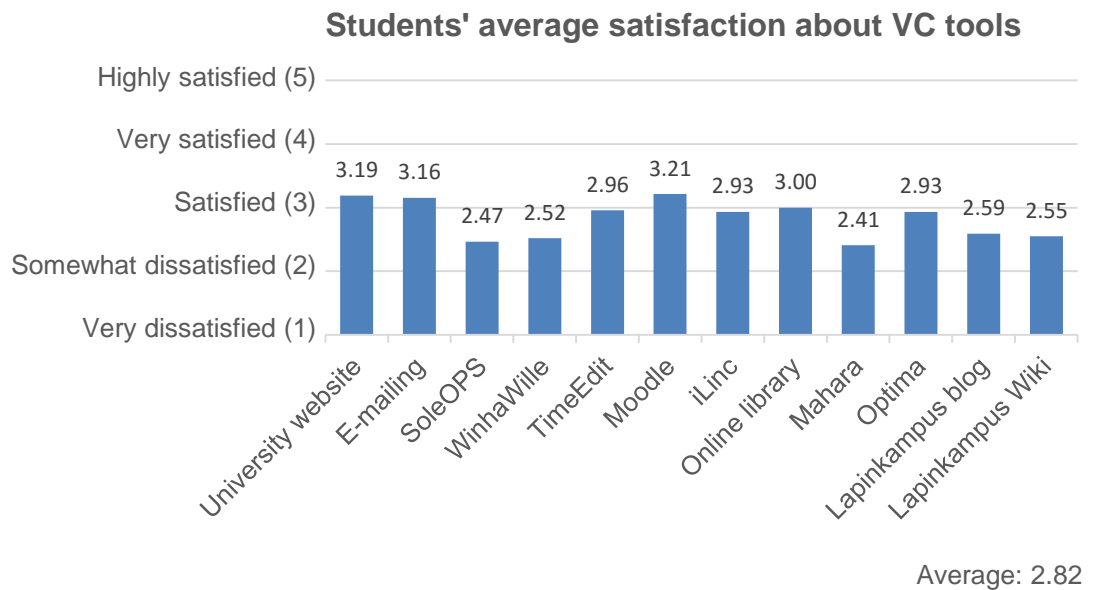


Figure 6. Students' average satisfaction concerning VC tools

As it is visible, most of the tools reach the minimal satisfaction level amongst students. However, SoleOPS, WinhaWille and Mahara scored low, which can be explained by the confusing, old-fashioned user interface and the inconvenient structure of the services. For instance the curricula of three consecutive classes of Business Information Technology are categorized under different departments on SoleOPS, which makes many students confused. Figure 7 displays answers collected on question 21 limited to students, measuring their overall satisfaction about VC services in Lapland UAS.

Overall level of satisfaction of students concerning VC services

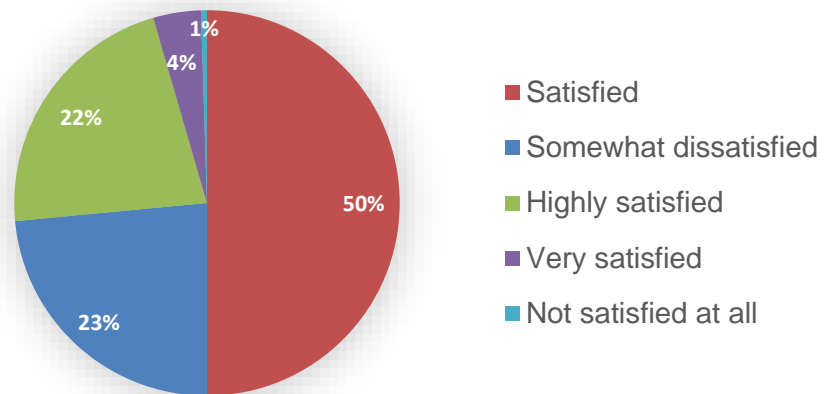


Figure 7. Students' overall satisfaction concerning VC services

As is shown in the figure above, 76 % of students are satisfied in general with VC services. Although the average level of satisfaction with 2.82 points (Figure 6) is somehow adequate, the answers to the open-ended questions and the interviews reveal many negative feelings amongst students.

Many respondents reflected on the confusing interfaces and an unclear structure of different tools. A student exemplifies, it is “not easy to find information about online services” on the university website. Another student comments on SoleOPS “sometimes it is difficult to find Free-choice electives”. A student points out that TimeEdit should present personal weekly routine right after logging in. Exchange student Burik (2015) compares the tools to her home university’s services: “TimeEdit works in a way that you have to look not for the lectures [...] but the groups they belong to. Since I am an exchange student, I have courses with different groups. So I have to put all the timetables of all groups together, and now my timetables are full of lectures which I am not attending to. [...] In the Hungarian system I can see only the relevant courses and lessons, nothing else”. Additionally, many students say that accessing timetables takes too many clicks and complicated login procedure.

As a consequence of the numerous different tools, the user interface and the information structure of environments differ, which result in confusion amongst students. As Pruikkonen (2015a) highlighted, the different logic of tools is really hard to follow and remember all the time, therefore she often gets lost while using VC services. Exchange student Burik (2015) and full-time student Klimenko (2015) with many of the questionnaire respondents share the same opinion. They explain, after certain amount of time they know how to use the tools. However, they agree that it would be better to have a more complex, but integrated environment where they can access all the necessary functions. (Burik 2015; Klimenko 2015.) Consequently, many tools are not harmonized with each other and do not follow usability guidelines. The old-fashioned interfaces and inconsistent information structure is difficult to follow and understand for students.

The unclear structure can be explained by other reasons. The course environments and study material are designed by the teacher responsible for the course. Most of the lecturers teach the same courses over and over year by year. Based on students' responses in the questionnaire, teachers are often not motivated to design these environments properly. As a result, the course pages get overwhelmed and unclear. Pruikkonen (2015a), Head of eLearning Centre argues "this problem originates from the lack of interest, the motivation of the teacher to take some time and sit down to design the environment. People are not motivated".

Mobile devices are getting more and more popular due to the rapid growth of technology. Many students would appreciate tools and services optimized for mobile devices. Students have problems to access content in "Moodle or any other systems, because they do not have the mobile version. Even if they do, it is not complete, like the desktop version" on mobile devices. Another student emphasizes that it is not convenient to perform tasks via mobile phone. A third student explains, TimeEdit and WinhaWille work on mobile, but other services do not. As mobile devices get more and more popular, the development of mobile environments for VC services is demanding.

As SDL states, the customer is always one of the co-creator of value (FP6) and value is uniquely determined by the beneficiaries (FP10). To enhance students' well-being, it would be essential to review and reconsider the structure of services cooperatively with students (Lindholm 2015a). As Lindholm (2015a) recommends, the university's management "should try to find ways to systematically collaborate with students", because they are the key points the VC service package. In fact, employees of eLearning Service Desk cannot see the Virtual Campus the same way as students, because they do not use it the same way. Employees of eLearning Service Desk look at the services from technical aspect, focusing on the well-being of hardware and software components instead of users. Therefore, the knowledge of students should be involved in the value coproduction. (Lindholm 2015a.) Consequently, finding a way to involve students in the VC service development is necessary. A cooperation framework as a development possibility is described in chapter 6.

5.4 Teachers

Teachers experience VC services differently. As it was discussed in section 3.5, lecturers mostly use the tools to do their jobs, therefore the VC services, especially communication channels are key factors for teachers. As teachers stay longer time period at the university than students, they have more understanding about the context and the usage about the services. Figure 8 displays the average usage of tools utilized in Lapland UAS based on teachers' responses. The questionnaire recorded 36 of teachers' replies.

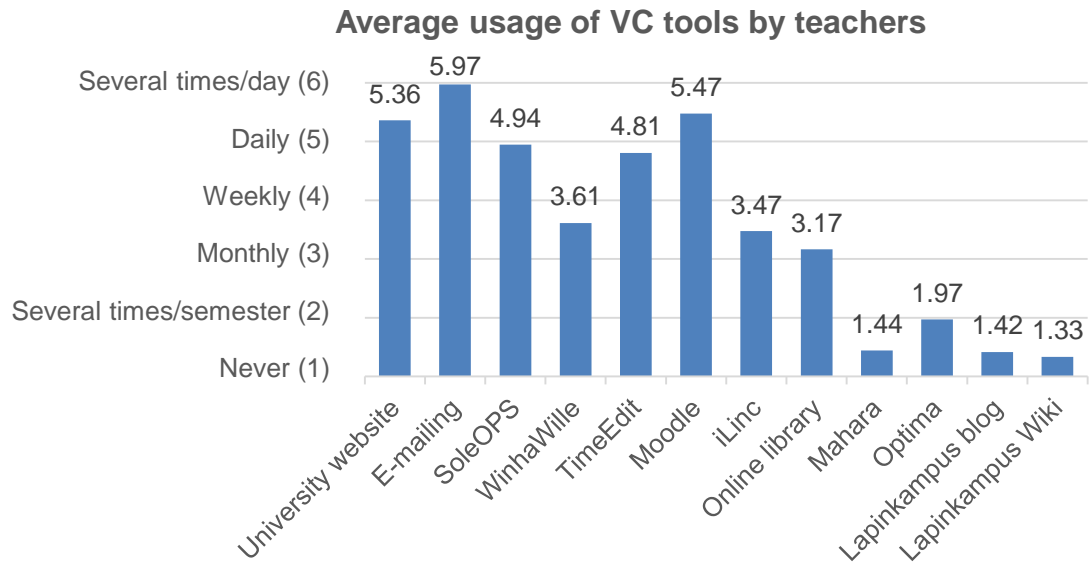


Figure 8. Average usage of VC tools by teachers

As it is visible, generally all the tools are used by teachers with higher intensity compared to students. Seemingly, teachers spend more time using the VC services than students, as they accomplish work procedures. This observation is approved by the answers provided to question 11 (Appendices 1 & 2) as teachers spend an average of 17.6 hours weekly in the VC, meanwhile students only 11.28. The university website, the e-mailing service and Moodle are used with the highest intensity. Similarly to students, some services, like Lapinkampus Blog and Wiki, are rarely used. However, the numerical values about teachers' satisfaction demonstrated in Figure 9 and Figure 10 below show interesting results about the satisfaction of lecturers.

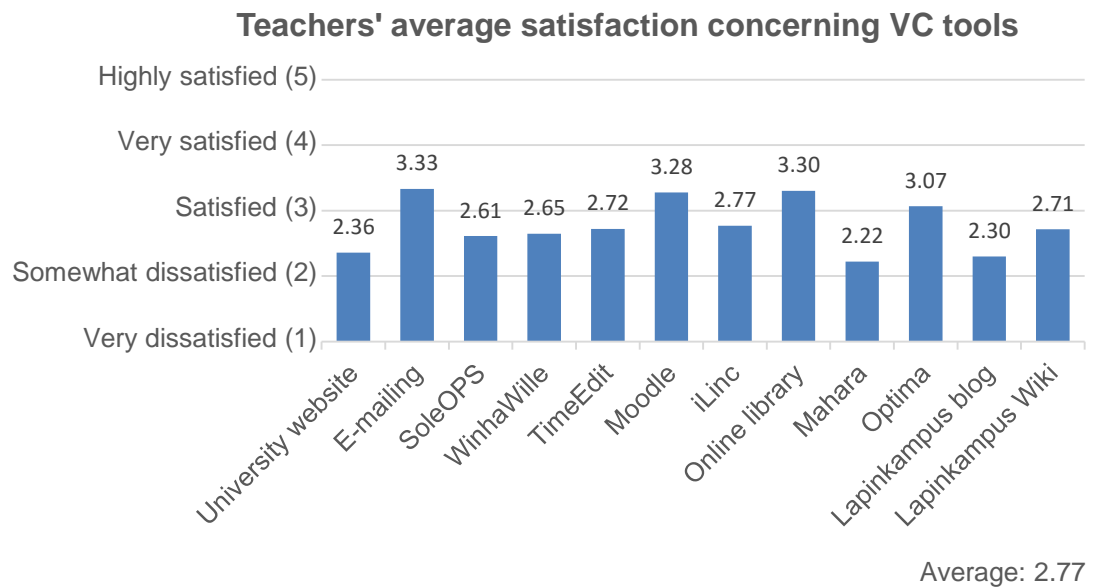


Figure 9. Teachers' average satisfaction concerning VC tools

Teachers' satisfaction about the individual tools is similar to students' scores, but the overall satisfaction is different. As illustrated, the average of the results on different tools is only 2.77, which is slightly lower than students' results. Furthermore, the pie chart on Figure 10 also confirms, that a higher proportion of teachers are somehow dissatisfied about the services compared to students' replies.

Overall level of satisfaction of teachers concerning VC services

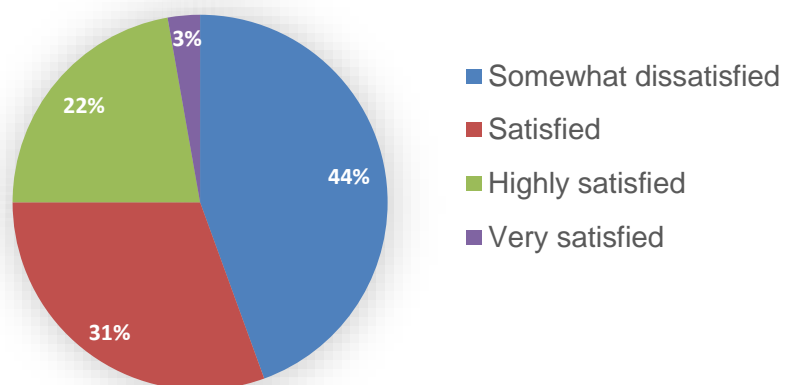


Figure 10. Teachers' overall satisfaction concerning VC services

The explanation for the dissatisfaction is the broader view on the services, which teachers have concerning VC services (as it was discussed in section 5.2). The analysis of qualitative data reveals that many teachers feel confusion because of the high number of tools and the inconsistent information structure.

Additional tools are used by teachers beyond the ones listed in Table 4. Principal lecturer Ryabov (2015) highlights that “for teachers there are at least ten different tools available [...] We are often confused to select which tool to use [...], many of my colleagues, including myself, do not remember how to use some of the tools”. On a general level, teachers have got used to the usage of the “important” tools. However according to Jäminki (2015), novice teachers might face challenges to get known to the different services and tools. Ryabov (2015) concludes, the tools used on everyday basis are easy to learn, e.g. Moodle. However, some comments reveal difficulties with different systems, for instance the small space of the e-mail box result in lost mails of teachers, which can lead to serious consequences.

Lecturer Jäminki (2015) points out the root of the problem as nobody asks teachers what systems they would like to use. This comment clearly shows the goods-dominant ways of thinking in the service design. Based on the feedbacks, teachers expect much less tools to use with more simple usability and clear information structure. To follow the principles of SDL, teachers should be involved in the service design more intensively than they are at the moment.

5.5 Staff members

The last user group to be analysed are staff members. This user group mostly involves secretaries, educational managers, librarians and employees responsible for other supporting procedures. Figure 11 displays the average usage of tools utilized in Lapland UAS based on staff members’ responses. A total number of 17 answers from staff members were collected through the questionnaire.

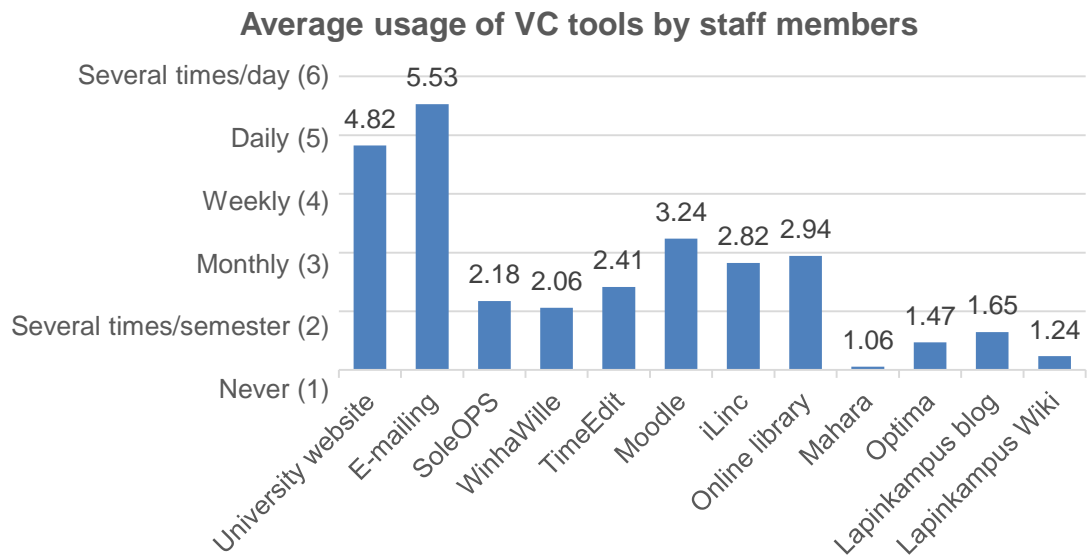


Figure 11. Average usage of VC tools by staff members

Staff members access the university website and the e-mailing service with higher activity than any other service. However, the rest of the tools are not used on daily basis by staff members, as these services aim to serve students' needs. Consequently, staff members evaluate VC services mostly based on the services offered by university website and e-mailing. Figure 12 and Figure 13 represent the satisfaction level for staff members for different tools and on overall level.

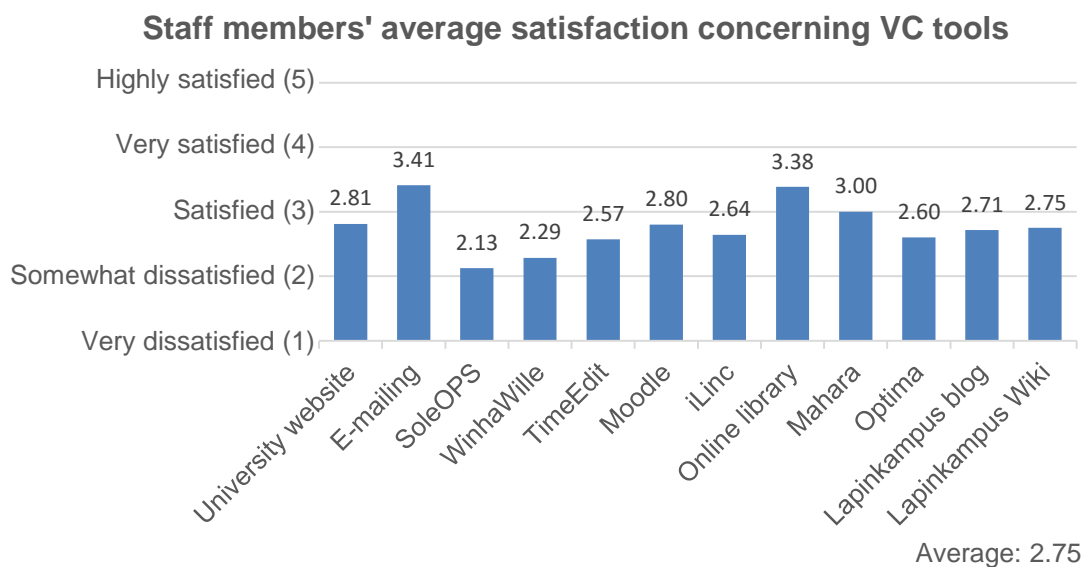


Figure 12. Staff members' average satisfaction concerning VC tools

The average level of satisfaction is 2.75 points, which is the lowest across the three user groups. As students scored 3.19 points in average (Figure 6), staff members evaluated the website at a level of 2.36 points (Figure 9), while teachers formed an average of 2.81 points (Figure 12). A possible explanation of this difference can be the different tasks performed through the services. As it was described in chapter 3, different user groups use the services in different ways, therefore the level of satisfaction is naturally different.

The university website does not reach the level of satisfaction of staff members either. Staff members reflected on the unclear information structure and old-fashioned interface of the website. For example an employee highlights, to find contact information about a person using the search engine, it is not possible to find contact information based on occupation or department. Therefore, the name of the person must be known to access contact information on the website. However, students do not experience this problem, because typically they use webpage in different ways.

SoleOPS and WinhaWille received comments on the old-fashioned and confusing interfaces from staff members as well. The out-of-date interfaces of these tools seems to affect the reliability and overall satisfaction of all user groups. Additionally, staff members highlight that these tools are quite slow and consume a lot of unnecessary time of their work, which can derive from the out-of-date technologies in use.

As seen in Figure 12, only three tools reach the minimal satisfaction level of staff members. Based on the comments and the interviews, majority of staff members would like to have wider possibilities, especially including mobile devices, to connect with other actors. Similarly to students and teachers, staff members emphasized the need for a well-designed mobile website.

Easy to use communication channels are essential for staff members. As e-mailing scored with 3.4 points, the answers to open-ended questions support the fairly good satisfaction, as many staff members answered “no problems” and “works

well". However, according to feedbacks and observations, students are hard to reach through the school's e-mailing system. To resolve this issue, student service coordinator Piispanen (2015) uses external communication channels, such as Facebook and Google Hangouts. She argues, using social media "it is much easier for students and teachers to reach each other" (Piispanen 2015). Others do not prefer this way of communication, as Ryabov (2015) highlights "information which is published on social media might be confidential about internal processes or studies, which should not be made public". Nevertheless, Piispanen (2015) is satisfied with VC services after all, but she hopes to have a tool, "which is an easy to use communication channel between students and teachers both on computer and mobile phones". The pie chart displayed in Figure 13 shows the overall level of staff members about VC services.

Overall level of satisfaction of staff members concerning VC services

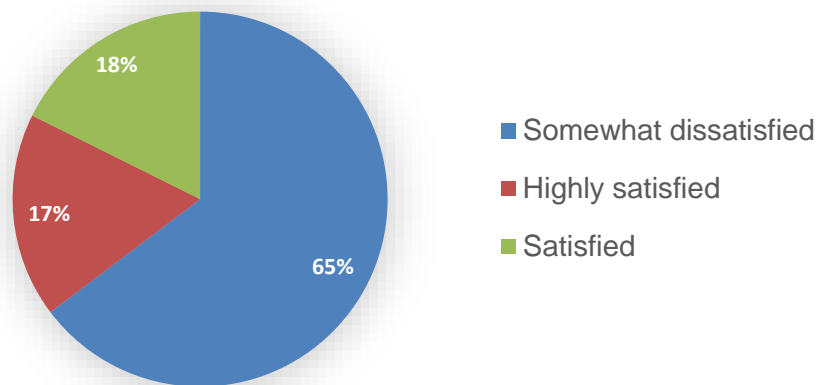


Figure 13. Staff members' overall satisfaction concerning VC services

As illustrated in Figure 13, staff members seem to be the most dissatisfied user group. 65 % of staff members express dissatisfaction regarding the tools utilized in the VC service package of Lapland UAS. The dissatisfaction draws from the confusing, old fashioned interfaces and many different tools. Furthermore, staff members experience loss of information due to the unreliable communication channels, which also affected their responses.

6 DEVELOPMENT RECOMMENDATIONS FOR VIRTUAL CAMPUS SERVICES AT LAPLAND UAS

This chapter begins with a short summary of the data collection and analysis. The widest service quality gaps and core problems are described and analysed. Further, recommendations are made for the organization to fill the recognized gaps through this research and improve overall service quality. Lastly, a cooperation framework is described, aiming to involve students in the development of VC services at Lapland UAS. The cooperation framework is a recommendation for eLearning Services and IT Service Desk, by which students could be involved in the development of VC services.

The general level of satisfaction of users is different. Typically teachers and staff members express dissatisfaction. As the analysis revealed, users would like to have less tools with better usability and understandability. Nevertheless, the operant resources of eLearning Service Centre and IT Service Desk employees provide prompt values to users through the support on a general level.

Cooperation and communication are key factors to success in the present time (Haukkamaa, Yliräisänen-Seppänen & Timonen 2015, 6; Vargo & Lusch 2004, 6). As Lindholm (2015b, 12) highlighted, the cooperation between IT and business departments is problematic at Lapland UAS currently. The core problem in the communication as experienced by Lindholm (2015a) is visible in the VC service design as well. The analysis shows that there are too many different tools utilized in the VC service package and users are not asked what kind of tools they would prefer to use. Senior lecturer Jäminki (2015) also emphasizes that nobody asks teachers in advance of applying different tools, which verifies a goods-dominant way of thinking already discovered by Lindholm (2015a). The usage of alternative environments led to inconsistent information structure, which is hard to understand for many users. The complicated information structure becomes an obstacle in the cooperation and communication. Users often get lost in the environments and they forget how to use the tools. Since the organization is new,

many practices and standard procedures are not yet structured (Lindholm 2015a; Jäminki 2015), which can explain the problems above.

Mobile devices are popular amongst users. Many users from all user groups regularly access the tools, but not all of them are optimized for smaller screen sizes, and therefore the usability is not satisfactory. The development of mobile version of current services is considerable, as more and more users access the information systems from mobile phones and tablets.

Beyond current communication channels, users would appreciate a tool for mobile devices, by which they can directly reach specific groups of university members. Accordingly, a mobile application could be developed, which allows actors to easily reach each other from their smart phones. A mobile application for instant chat messaging on mobile devices could enhance the communication between stakeholders. The institution uses Microsoft Lync as an instant chat messenger tool (Piispanen 2015; Ryabov 2015). However, majority of users do not know the presence and capabilities of this tool. The mobile version of this software, which is developed on many mobile platforms already (Microsoft 2015), could serve as a communication tool by which users could reach each other efficiently.

The university website is a crucial element of the VC service design. The website is the main source of information for all user groups and the public audience, and therefore usability and understandability are critical aspects in the website design. However, many users, especially teachers and staff members feel confused about the information structure of the university website. As a suggestion, the deep usability analysis and further development of the website is suggested. As Ryabov (2015) recommended, the information structure of the website needs reconsideration to allow the users find relevant information in fewer clicks. Furthermore, he “would recommend that the website includes division into departments or degree programs”. This approach would allow every department to have individual space for development. “Currently departments do not have their own

space, which is a problem, because departments should be able to update their own information regularly”. (Ryabov 2015.)

By integrating the different tools into one website, users’ well-being can be enhanced and procedures can be simplified. A service, where users could access necessary tools for their duties, such as timetables, deadlines and e-mails is suggested. From the students’ point of view, the development of an integrated website called e.g. Student Pages, focusing on students’ needs is proposed. This idea originates from the development work on the course Competence Development Project at Lapland UAS. The researcher amongst other students has developed the idea during the course in more details. As an outcome of the course, a proposal for service design, a presentation and a preliminary implementation was made by the team. The final presentation received great feedback from the present audience, involving many students. Students agreed that they would highly appreciate such service, where they can access all necessary material and do administration procedures throughout their studies. A design idea for the Student Pages is displayed on Figure 14.

As it is displayed, the website combines all major services students use on regular basis. As students Burik (2015) and Klimenko (2015) pointed out, it would be better to have one tool where they can accomplish more tasks, rather than to have several different environments. After logging in with their unique student number, on one page students could get all necessary, personalized information from the different tools. The service could include e-mailing, course descriptions and re-exam dates from SoleOPS, timetables from TimeEdit, assignments and their deadlines from Moodle, grades from Winha and exchange program possibilities from SoleMOVE. The environment could include many other features to focusing on needs of students, i.e. student newspaper, alumni services, list of project possibilities, practical training placements and social events.

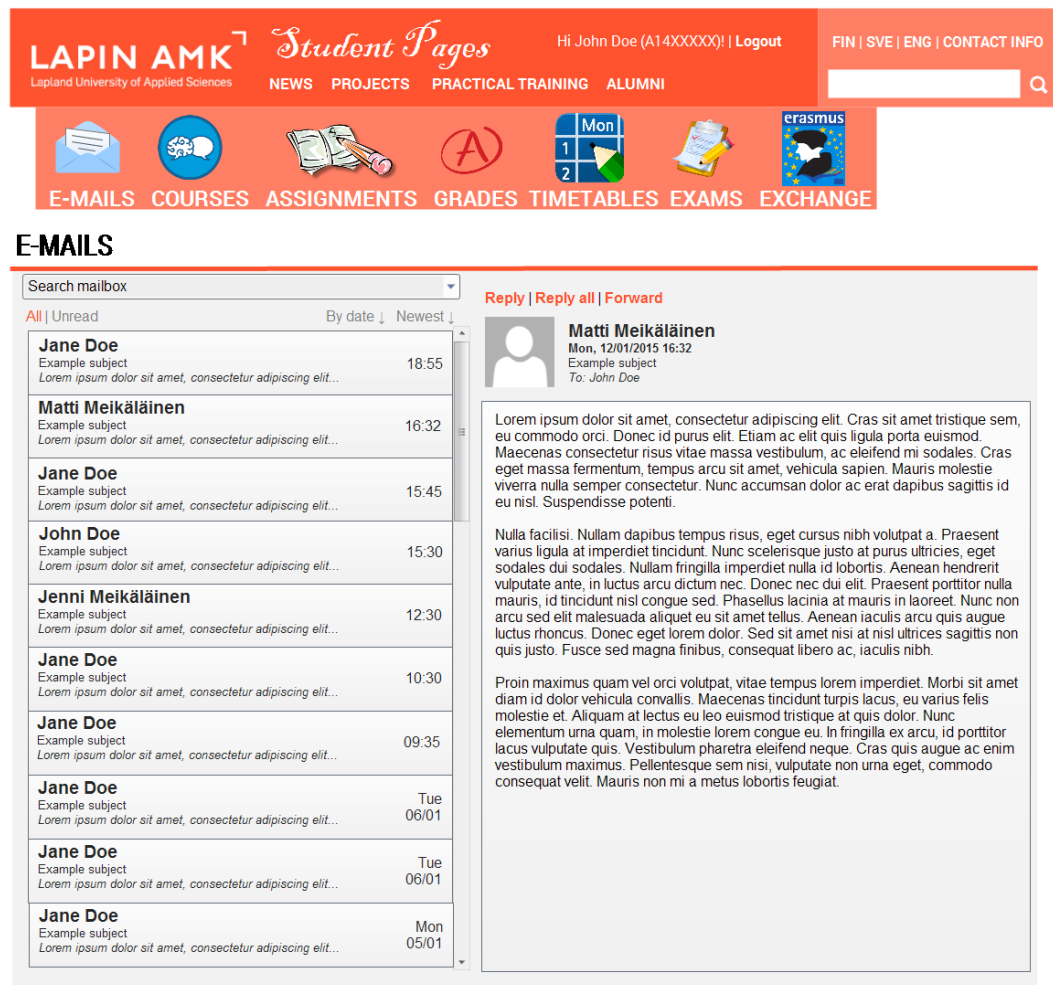


Figure 14. Interface design idea for Student Pages

On the pattern of Student Pages, teachers and staff members could have a similar, integrated environment to simplify processes. Instead of many third-party tools, the organization could consider to apply a more complex tool, which integrates more functions into one reliable environment. The organization could make requests for try-out versions of other education administration systems, which cover functions of current tools. Alternatively, the organization could utilize resources for an own development for a more complex system. Exchange student Burik (2015) suggests, the timetabling functions of TimeEdit and the course management system of SoleOPS could be combined in a way that students see the timetables of their courses in the same environment as they enrol.

Lapland UAS does not offer any service for alumni. The Student Pages could also include a simple forum, which would serve as a bridge between the university's current employees, students and graduated students. By creating a channel of communication between alumni and current students, the networking possibilities and motivation of students can be enhanced. The forum could allow to organize events easily and raise relevant topics of discussion. Students could maintain relationships after graduation and share experiences easier.

To enhance service quality by following the principles of SDL, the more users added involvement in the value co-production process is recommended. As enterprise architect Lindholm (2015a; 2015b) suggested, a systematic way of cooperation between actors should be established. Students as the main beneficiaries could be involved in the development through teachers and the eLearning Centre (Lindholm 2015a). In the following section a cooperation framework between eLearning Service Centre and students are introduced.

Currently there are potential resources at Lapland UAS, possessed by employees of eLearning Services and students, which can be turned into value-creating resources. By integrating students' value creating resources concerning the needs, and expertise of eLearning developers, the quality gaps discovered in chapter 5 can be filled. As Lindholm (2015a) pointed out, students are important actors in relation to VC services, because they use the tools with the highest impact. If students could get involved the design of services and contribute to the functionality of these services, service quality could be enhanced. The operant resources of students related to VC services could be useful for the whole organization, since other actors do not use the tools in the same way as students do. For instance, eLearning Centre employees typically look at the technical aspects rather than the needs users have. (Lindholm 2015a.)

Practical training is mandatory for every student during their studies. A group of motivated students under the supervision of an expert could work on VC development during the period of practical training. Employees of eLearning Centre and students could cooperatively design and implement services and reconsider

the information structure of current tools in use. As new students start their practical training period every year, newcomers can be involved in the process.

There are numerous foreign and exchange students studying at Lapland UAS. The involvement of foreigners beyond native students in the development could strongly enhance the process, as many of them have prior experience in using VC services at other universities. As the interview with exchange student Burik (2015) pointed out, exchange students compare the services at Lapland UAS to their home universities' service packages. The operant resources and previous experience of foreign students can highlight on some aspects, which might be invisible without utilizing their resources. This approach of VC service development would improve students' competences, the service quality and the level of users' satisfaction.

The involvement of the students in such projects would not cost too much for the institution and it would give a broad overview for the institution regarding students' expectations at the same time. The required expertise and the will to improve VC services is available from eLearning Services, and therefore there is a potential to improve service quality. The organization is oriented to a goods-dominant perspective, hence actors do not follow value co-creation consciously, which is one of the sources of wide service quality gaps. During the development, students would be responsible for collecting further needs, analyse, design and implement the requirements, while IT Service Desk and eLearning Service employees would supervise and guide trainees in the development process.

A change based on the analysis in the current system could positively affect value co-creation at the institution. Many students had problems finding practical training placement, which could be worked around using this suggestion. Secondly, the placement offered to the might be more attractive to some students, because they do not need to move to other place, get used to new environments and colleagues. Finally, the practical training period is long enough to create something remarkable.

7 CONCLUSIONS

The advent of IT has redesigned the modern life. As a consequence of the capabilities of computers many new tools, technologies, principles and workplaces have emerged. However, digitalization has also resulted in the disappearance of traditional practices in many fields, for instance education. In the past decades higher educational institutions started to use IT and software solutions as tools to enhance teaching and administration processes. Beyond the regular campus areas of universities, VCs were created. Ultimately, digitalization has made distant learning possible, which has become popular amongst adults. Despite the fact that almost every university utilizes VC services, there is no common definition concerning the meaning of the concept.

In this thesis work, a research on the understanding, characteristics and challenges of VC services was made. The meaning and main attributes of VC services were analysed. VC services collect numerous, computer-based solutions aiming to assist students' learning and the administration procedures. It was described, how VC services are utilized in higher education today. The typical user groups, their goals and typical use-case scenarios were described and critically analysed. Additionally, the VC services were investigated from the aspect of the emerging worldview of SDL. The different needs of stakeholders and the way they co-create value for the beneficiaries were studied.

As a single case study, the VC service package of Lapland UAS was introduced and analysed. The analysis aimed to discover users' satisfaction concerning the services. The in-depth interviews and questionnaire survey made it possible for the researcher to collect empirical data regarding users' experience. Using the SERVQUAL methodology, the gaps between users' expectations and perceptions were discovered and analysed.

According to the findings, the expertise and empathy of eLearning Service Centre and IT Service Desk is satisfactory. However, the institution utilizes numerous different tools currently, which causes confusion for many users. Due to the many

different and inconsistent environments, the reliability of the service package is low from users' point of view. The results indicate that some of the tools are not used regularly by any of the user groups. Staff members and teachers express more dissatisfaction than students, because employees of the institution have a broader view and more experiences about the tools in use.

On the basis of the research findings, it can be suggested that the institution reconsider the tools and the service package currently in use. Many of the users agree that there are too many tools utilized at the moment, which are confusing, old-fashioned and hard to understand. To improve service quality and enhance users' well-being, the combination of some of the systems, for example SoleOPS and TimeEdit is proposed and the more structured design of the tools is suggested. The structure of the university website is suggested to be redesigned in a way, where individual departments have their own information space for development.

An integrated website could be developed which allows users to access all necessary features in one environment. To enhance students' well-being, the development of Student Pages are suggested, where students can find all relevant features on one integrated page. At the same time when the research was conducted, a detailed description and preliminary implementation of Student Pages was introduced. During the final presentation of the service, present students and teachers from the audience appreciated the idea and agreed on the fact that such service could enhance their well-being.

Since Lapland UAS has no online tool for alumni networking, the Student Pages could include alumni in order to keep connected not only to current, but graduated students as well. By implementing alumni service functions, the institution, students, teachers and employees could keep in touch with graduates, which would enhance the communication and networking possibilities of all stakeholders.

To follow the principles of SDL, Lapland UAS should find a way to systematically involve students in the service design. It would be worth considering, to offer

practical training project and other coursework for students focusing on VC service development. By involving students in the VC service design, the gaps between users' expectations and perceptions could be filled and the value co-creation could be enhanced. Rather than utilizing many operand resources in the form of different tools, it is suggested to find new ways of cooperation with actors to increase the quality of VC services at Lapland UAS.

A final interview concluding the research was conducted with Pruikkonen, Head of eLearning Service Centre and eLearning developer Nijbakker (2015b). The results of the research matched their assumptions regarding service quality and the level of user satisfaction. As Nijbakker (2015b) highlighted "The findings match our expectations, we already noticed some of the issues. Yet we had no proof and research behind our assumptions [...] the research is very useful for us, because it provided us a good understanding about the current situation": Consequently, the analysis proved the assumptions about VC services utilized at Lapland UAS and revealed several issues. (Pruikkonen & Nijbakker 2015b.)

Pruikkonen and Nijbakker (2015b) agree on the finding that the number of tools is too high, which leads into dissatisfaction and confusion of the users. The low usage of some tools amongst students, i.e. library services, Lapinkampus Blog or Lapinkampus Wiki was a surprise for eLearning Centre employees. However, the fact that users are satisfied with the empathy and expertise of eLearning Service Centre was considered as a positive result. Some of the findings were already presented on the meetings of eLearning Centre and a process of VC development has started based on the findings. (Pruikkonen & Nijbakker 2015b.)

The development recommendations are appreciated by eLearning Centre (Pruikkonen & Nijbakker 2015b). Pruikkonen and Nijbakker (2015b) favour the suggestion of a more integrated tool, which would facilitate the access to information and enhance level of user satisfaction. The idea of Student Pages is supported by eLearning Centre (Pruikkonen & Nijbakker 2015b). According to Pruikkonen (2015b), the design of a similar service to Student Pages has already started and the institution aims to integrate more services into one website. The findings

helped the institution and eLearning Centre to realize the importance of mobile devices. The further development processes will take the raising popularity of mobile devices into consideration. The development suggestions were already discussed and some development has already started based on this research. (Pruikkonen & Nijbakker 2015b.)

The service-dominant approach inside the organization suggested by Lindholm (2015b) and by this research is supported by Pruikkonen and Nijbakker (2015b). As Pruikkonen (2015b) emphasizes, eLearning Centre is always eager to involve students in the development. Employees of eLearning Centre agree that the most efficient way to enhance the level of service quality, is to intensively involve users in the service design. (Pruikkonen & Nijbakker 2015b.)

The present research was limited to the extent of a Bachelor's Thesis. The research scope was narrowed down to the research on the concept of VC and the analysis of VC services utilized currently at Lapland UAS. Despite the fact that suggestions were made based on the findings, no concrete implementation was made yet. There is a call for further study to analyse the independent tools, especially the university webpage in more details. Additionally, the research has put more focus on and involved the personnel whose professional competencies or study field are related to IT or Computer Science in some way. Therefore, there is a need for further research which focuses on other users, who have less experience and knowledge concerning computer-based environments. By conducting similar research in other departments of the organization, future studies can reveal more possible service quality gaps and identify further improvement possibilities. Finally, the suggested cooperation framework and the idea of Student Pages require further research and development.

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APPENDICES

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| Appendix 1. | Virtual Campus services satisfaction survey - Lapland University of Applied Sciences |
| Appendix 2. | Virtuaalikampuksen käyttäytyvyyskysely - Lapin ammattikorkeakoulu |
| Appendix 3. | Interview transcript with A. Pruikkonen, Head of eLearning Centre and eLearning developer P. Nijbakker |
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Appendix 1.

1 (6)

VIRTUAL CAMPUS SERVICES SATISFACTION SURVEY - LAPLAND UNIVERSITY OF APPLIED SCIENCES

Greetings!

I am Péter Ivanics, a student from Hungary graduating from Lapland University of Applied Sciences in this semester. I would like to ask for your help in my thesis/research work. By taking few minutes to fill this survey about user satisfaction regarding the Virtual Campus services at Lapland UAS you could grant me great support and assist to my research work.

Virtual Campus is the collection of offerings, intended to support study processes of students, that are conducted in computer-based, virtual environments, such as online classrooms in iLinc, courses in Moodle, library services, ISP record handling in Winha, accessing course descriptions in SoleOPS.

Filling the questionnaire takes around 5-8 minutes. Thank you very much for your support!

Sincerely,

Péter Ivanics

peter.ivanics2@edu.lapinamk.fi

* Required

PERSONAL INFORMATION

1. What is your gender? *

- ☐ Male
- ☐ Female

2. In which age group are you? *

- ☐ 17-21
- ☐ 22-25
- ☐ 26-30
- ☐ 30-50
- ☐ 51-

3. What is your position at the university? *

- ☐ Student
- ☐ Teacher
- ☐ Staff member

4. In which city do you study/work mostly? *

- ☐ Rovaniemi
- ☐ Kemi
- ☐ Tornio
- ☐ I study/work online

5. How long is your relation with the university? *

- ☐ Less than a year
- ☐ 1-2 years
- ☐ 3-5 years
- ☐ More than 5 years

6. In which language do you use Virtual Campus services mostly? *

- ☐ Finnish
- ☐ English
- ☐ Both

ASSESSMENT OF USER EXPECTATIONS AND EXPERIENCE

Questions in this section are five point scale ranging from “Strongly disagree” (1) to “Strongly agree” (5) accomplished for each statement. Ratings on statements marked with (-) were reverse-scored prior to data analysis.

7. Please rate the following statements from your perspective!

These questions are about your expectations of Virtual Campus services in general.

- 1) The Virtual Campus should be up to date.
- 2) The technology used for online services should be reliable.
- 3) Online materials should be accessible any time at my convenience.
- 4) Finding instructions/guides about in the use of the Virtual Campus services should be easy.
- 5) Communication tools in the Virtual Campus, e.g. e-mail, chat/forum rooms should be easy to understand.
- 6) My requests to the service desk should be handled quickly and fluently.
- 7) The service desk should be reliable and willing to help at any time.
- 8) I should feel safe about my personal data and files stored in the Virtual Campus, e.g. homeworks uploaded.
- 9) Online learning, administration and accessing online materials should not be confusing because of technical problems.
- 10) The Virtual Campus services should fulfill my needs and expectations.
- 11) Service desk employees should be polite and friendly.
- 12) Service desk employees should give me personal attention.

- 13) Virtual Campus services should be designed according to my own needs.
- 14) Usage of these services should be clear.
- 15) I should not get lost when using online environments.
- 16) The different design elements and layout of different services should not be confusing
- 17) Virtual Campus services should be in harmony by having the same design elements in all systems
- 18) I should not have higher workload to accomplish tasks in online environment in comparison to traditional practices
- 19) Technical problems and barriers should not discourage me from learning and working online
- 20) Not meeting my classmates, teachers, students or colleagues face-to-face should not prevent me from knowing as well as my on-site contacts.

8. Please rate the following statements from your perspective! *

These questions are about the perceptions you get from Virtual Campus of Lapland UAS. Please consider the statements and rate them ACCORDING TO OUR services!

- 1) Our Virtual Campus is up to date
- 2) The technology used for online services is reliable
- 3) I can access my online materials any time at my convenience
- 4) It is easy to find instructions/guides about in the use of our Virtual Campus services
- 5) I am satisfied with the use of communication tools in our Virtual Campus, e.g. e-mail, chat/forum rooms
- 6) My requests to our service desk are handled quickly and fluently
- 7) Our service desk is reliable and willing to help any time.
- 8) I feel safe about my personal data and files stored in our Virtual Campus, e.g. home-works uploaded.
- 9) Online learning, administration and accessing online materials is often confusing because of technical problems in our Virtual Campus (-)
- 10) Our Virtual Campus services fulfill my needs and expectations
- 11) Our service desk employees are polite and friendly
- 12) Our service desk employees give me personal attention
- 13) Our Virtual Campus services are designed according to my own needs
- 14) It is clear how to use our online services
- 15) I often get lost when using our online environments (-)
- 16) The different design elements and layout of different services are confusing at our university (-)
- 17) It would be more convenient and clear to have the same design elements in all systems
- 18) I have higher workload to accomplish tasks in our online environment in comparison to traditional practices (-)
- 19) Technical problems and barriers do not discourage me from learning and working online
- 20) Not meeting my classmates, teachers, students or colleagues face-to-face does not prevent me from knowing as well as my on-site contacts.

9. Please rate the following statements from your perspective! *

- 1) The flexibility and customization possibilities provided by online environments are important for me
- 2) In my opinion, some services should be improved

SPECIFIC QUESTIONS RELATED TO VIRTUAL CAMPUS AT LAPLAND UAS

Question 11) is Six point scale ranging from "Never" (1) to "Several times per day" (6) and question 13) is a Five point scale ranging from "Very dissatisfied" (1) to "Highly satisfied" (5) accomplished for each statement.

10. How often do you use the following Virtual Campus services? *

- 1) University website
- 2) E-mailing
- 3) SoleOPS
- 4) WinhaWille
- 5) TimeEdit
- 6) Moodle
- 7) iLinc
- 8) Online library
- 9) Mahara
- 10) Optima
- 11) Lapinkampus blog
- 12) Lapinkampus Wiki

11. How many hours per week do you use the Virtual Campus services during study period? *

12. How satisfied are you with the following Virtual Campus services in general? *

- 1) University website
- 2) E-mailing
- 3) SoleOPS
- 4) WinhaWille
- 5) TimeEdit
- 6) Moodle
- 7) iLinc
- 8) Online library
- 9) Mahara
- 10) Optima
- 11) Lapinkampus blog
- 12) Lapinkampus Wiki

13. In general, can you perform tasks easily in these environments? *

☐

Yes

☐

No

14. Have you ever experienced a problem in any of these environments that prevented you from performing the task? *

☐

Yes

☐

No

15. Have you ever been confused about or lost in these systems when performing tasks? *

- ☐ Yes, I am often confused when I use these services.
- ☐ Sometimes I am confused how to use one of the systems.
- ☐ After proper amount of practice I know how to use these services.
- ☐ No, I can perform tasks easily in any of the Virtual Campus services.

16. Have you ever noticed any downtime/maintenance in any of the systems? *

- ☐ Yes
- ☐ No

17. If yes, please specify.

Around what time, which system was not working as it should; did you get proper error message / information, why the component was not working; could you perform your task later on?

18. Have you accessed these services through mobile device? *

- ☐ Yes
- ☐ No

19. If yes, could you perform your tasks easily on mobile devices?

- ☐ Yes
- ☐ No

20. If no, please specify.

Which system did you have difficulties with; could you find help/support to solve your problem; how fluently could you solve the problem; how long time did it take to solve the problem?

21. What is your overall level of satisfaction with the Virtual Campus services? *

- ☐ Not satisfied at all
- ☐ Somewhat dissatisfied
- ☐ Satisfied
- ☐ Very satisfied
- ☐ Highly satisfied

SPECIFICATION

In the following section please explain what types of tasks are causing you problems regarding the different environments. The following issues are guidelines for you to express your challenges/problems:

- *What kind of problems are on your mind that are not matching your expectations? (such as user interface, structure, confusing layout and so on)*
- *What kind of tasks you can not typically perform?*
- *Can you find relevant help/support/documentation to solve your problems?*
- *How easily can you resolve the problems if they occur?*
- *How often do you experience problems in that environment?*

Feel free to include your own impressions, ideas and recommendations related to that particular environment. If you do not have any comments on the environments, please leave the field empty.

22. University website

23. E-mailing

24. SoleOPS

25. WinhaWille

26. TimeEdit

27. Moodle

28. iLinc

29. Online library

30. Mahara

31. Optima

32. Lapinkampus blog

33. Lapinkampus Wiki

34. Comments

If you have any comment related to Virtual Campus services, which was not relevant to write about in the sections above, please describe it here.

Appendix 2.

1 (6)

VIRTUAALIKAMPUKSEN KÄYTTÄJÄTYTYVÄISYYSKYSELY - LAPIN AM-MATTIKORKEAKOULU

Tervetuloa!

Olen Péter Ivanics, unkarilainen opiskelija ja valmistun Lapin AMK:sta kevät lukukaudella 2015. Pyytäisin apuasi opinnäytetyöni tekemiseen. Käyttämällä muutaman minuutin tämän kyselyn täyttämiseen, autat suuresti tutkimukseni valmistumista. Kysely koskee Lapin AMK:n virtuaalisten kampuupalveluiden toimivuutta.

Virtuaalikampuksella tarkoitetaan tässä tapauksessa opintoja tukevia, tietokonepohjaisia virtuaaliympäristöjä kuten iLincin virtuaaliluokkahuoneet, kurssit Moodlessa, kirjastopalvelut, eHOPS-tietojen käsittely Winhassa ja kurssien hallinta SoleOPSissa.

Kyselyn täyttämiseen menee n. 5 - 10 minuuttia. Paljon kiitoksia osallistumisestasi!

Ystävällisin terveisin,

Péter Ivanics
peter.ivanics2@edu.lapinamk.fi

HENKILÖKOHTAISET TIEDOT**1. Sukupuoli: ***

- ☐ Mies
☐ Nainen

2. Ikä: *

- ☐ 17-21
☐ 22-25
☐ 26-30
☐ 30-50
☐ 51-

3. Asemasi Lapin AMK:ssa *

- ☐ Opiskelija
☐ Opettaja
☐ Henkilökuntaa

4. Missä kaupungissa opiskelet / työskentelet? *

- ☐ Rovaniemi
- ☐ Kemi
- ☐ Tornio
- ☐ Opiskelen / työskentelen verkossa

5. Kuinka pitkään olet ollut opiskelija/opettaja/henkilökuntaa AMK:ssa? *

- ☐ Alle vuoden
- ☐ 1-2 vuotta
- ☐ 3-5 vuotta
- ☐ Yli 5 vuotta

6. Millä kielellä käytät virtuaalikampuksen palveluja? *

- ☐ Suomeksi
- ☐ Englanniksi
- ☐ Molemmilla kielillä

KÄYTTÄJÄODOTUSTEN JA -KOKEMUSTEN ARVIOT

Questions in this section are five point scale ranging from "Strongly disagree" (1) to "Strongly agree" (5) accomplished for each statement. Ratings on statements marked with (-) were reverse-scored prior to data analysis.

7. Arvioi seuraavien väittämien paikkansapitävyyttä omasta näkökulmastasi. *

Tarkastele näitä väittämiä omasta näkökulmasta yleisesti!

- 1) Virtuaalikampuksen tulisi olla ajanmukainen.
- 2) Online-palveluiden käyttämisen tekniikan tulisi olla luotettavaa.
- 3) Materiaalien pitäisi olla käytettävissä milloin tahansa.
- 4) Palveluiden käyttöohjeiden pitäisi olla helposti löydettävissä.
- 5) Virtuaalikampuksen yhteydenpitovälineiden esim sähköposti, tulee olla helposti ymmärrettäviä.
- 6) IT-tukipalveluiden pitäisi reagoida avunpyyntöihin nopeasti.
- 7) IT-tukipalvelun pitää olla luotettavaa ja aina käytettävissä.
- 8) Minun pitäisi pystyä luottamaan henkilökohtaisten tiedostojeni kuten palautettujen tehtävien turvallisuuteen virtuaalikampuksella.
- 9) E-opiskelun, hallinnoinnin ja online-materiaalin käyttäminen ei saisi olla vaikeaa teknisten ongelmien takia.
- 10) Virtuaalikampuksen tulisi täyttää tarpeeni ja odotukseni.
- 11) IT-tuen tulisi olla kohteliasta ja ystävällistä.
- 12) IT-tuen pitäisi huomioida minut henkilökohtaisella tasolla.

3 (6)

- 13) Virtuaalikampuksen palveluiden pitäisi olla suunniteltu omien tarpeideni mukaan.
- 14) Näiden palveluiden käytön pitäisi olla selkeää.
- 15) Minun ei pitäisi eksyä alustoja käyttäessäni.
- 16) Eri alustojen graafisen ilmeen / ulkoasun ei pitäisi olla sekava muihin palveluihin nähden.
- 17) Virtuaalikampuksen eri palveluiden ulkoasujen pitäisi olla yhteensopivia.
- 18) Tehtävien suorittaminen online-ympäristössä ei saisi olla vaikeampaa kuin perinteiseen tyyliin tehtynä.
- 19) Tekniset ongelmat ja rajoitteet eivät saisi lannistaa opiskeluani ja työskentelyäni verkossa.
- 20) Se, etten tapaa opiskelutovereitani, opettajiani tai työtovereitani, ei saisi rajoittaa tietämystäni.

8. Arvioi seuraavien väittämien paikkansapitävyyttä omasta näkökulmastasi. *

Nämä kysymykset koskevat kokemuksiasi Lapin AMK:n virtuaalikampuksen käyttäjänä

- 1) Virtuaalikampus on ajanmukainen.
- 2) Online-palveluiden käyttämä tekniikka on luotettavaa.
- 3) Materiaalit ovat käytettävissäni milloin tahansa.
- 4) Palveluiden käyttöohjeet ovat helposti löydettävissä.
- 5) Virtuaalikampuksen yhteydenpitovälineet kuten sähköposti, toimivat mielestäni tyydyttävästi.
- 6) IT-tukipalvelut reagoivat avunpyyntöihin nopeasti.
- 7) IT-tukipalvelu on aina käytettävissä.
- 8) Pystyn luottamaan henkilökohtaisten tiedostojeni kuten turvallisuuden palautetut tehtävät virtuaalikampuksella.
- 9) E-opiskelun, hallinnoinnin ja online-materiaalin käyttäminen ei ole vaikeaa teknisten ongelmien takia.
- 10) Virtuaalikampus täyttää tarpeeni ja odotukseni.
- 11) IT-tuki on kohteliasta ja ystävällistä.
- 12) IT-tuki huomioi minut henkilökohtaisella tasolla.
- 13) Virtuaalikampuksen palvelut on suunniteltu omien tarpeideni mukaan.
- 14) Palveluiden käyttö on selkeää.
- 15) En eksy alustoja käyttäessäni.
- 16) Eri alustojen graafinen ilme / ulkoasu ei ole sekava muihin palveluihin nähden.
- 17) Virtuaalikampuksen eri palveluiden ulkoasut ovat yhteensopivia
- 18) Tehtävien suorittaminen online-ympäristössä ei ole vaikeampaa kuin perinteiseen tyyliin tehtynä.
- 19) Tekniset ongelmat ja rajoitteet eivät lannistaa opiskeluani ja työskentelyäni verkossa.
- 20) Se, etten tapaa opiskelutovereitani, opettajiani tai työtovereitani, ei rajoita tietämystäni.

9. Arvioi seuraavien väittämien paikkansapitävyyttä omasta näkökulmastasi. *

- 1) Online-ympäristöjen joustavuus ja muokattavuus ovat minulle tärkeitä.
- 2) Mielestäni joitain palveluja on parannettava.

4 (6)

VIRTUAALIKAMPUKSEN PALVELUIIHIN LIITTYVÄT ERITYIS KYSYMYKSET

Question 11) is Six point scale ranging from "Never" (1) to "Several times per day" (6) and question 13) is a Five point scale ranging from "Very dissatisfied" (1) to "Highly satisfied" (5) accomplished for each statement.

10. Kuinka usein käytät seuraavia virtuaalikampuksen palveluita? *

- 1) Koulun nettisivu
- 2) Sähköposti
- 3) SoleOPS
- 4) WinhaWille
- 5) TimeEdit
- 6) Moodle
- 7) iLinc
- 8) Online-kirjasto
- 9) Mahara
- 10) Optima
- 11) Lapinkampus blog
- 12) Lapinkampus Wiki

11. Kuinka monta tuntia käytät virtuaalikampuksen palveluja viikottain opiskelu lukukausien aikana? *

12. Kuinka tyytyväinen olet virtuaalikampuksen palveluihin yleisesti?*

- 1) Koulun nettisivu
- 2) Sähköposti
- 3) SoleOPS
- 4) WinhaWille
- 5) TimeEdit
- 6) Moodle
- 7) iLinc
- 8) Online-kirjasto
- 9) Mahara
- 10) Optima
- 11) Lapinkampus blog
- 12) Lapinkampus Wiki

13. Yleisesti ottaen, saatko hoidettua haluamasi asiat vaivattomasti näillä alustoilla? *

- ☐ Kyllä
- ☐ Ei

14. Oletko kohdannut ongelmia käyttäessäsi virtuaalikampusta, minkä vuoksi et voinut suorittaa tehtävää? *

- ☐ Kyllä
- ☐ Ei

15. Oletko koskaan ollut hämilläsi tai eksynyt sivustoille siitä käyttäessäsi? *

- ☐ Kyllä, olen usein hämmentynyt palveluja käyttäessäni.
- ☐ Joskus käyttö on vaikeaa.
- ☐ Harjoiteltuani käyttö sujuu.
- ☐ En ja osaan käyttää kaileleia virtuaalikampuksen palveluja sujuvasti.

16. Oletko koskaan huomannut käyttökatkoksia palveluissa? *

- ☐ Kyllä
- ☐ Ei

17. Jos vastasit kyllä, voitko tarkentaa?

Mihin aikaan ja mikä alusta ei toiminut halutulla tavalla? Saitko virheilmoituksen / lisätietoa ongelman syystä? Pystyitkö suorittamaan tehtävän myöhemmen?

18. Oletko käyttänyt palveluita mobiililaitteilla? *

- ☐ Kyllä
- ☐ Ei

19. Mikäli vastasit kyllä, oliko palveluiden käyttäminen helppoa mobiililaitteilla?

- ☐ Kyllä
- ☐ Ei

20. Mikäli vastasit ei, voitko tarkentaa?

Minkä palvelun käytössä sinulla oli ongelmia? Saitko virheilmoituksen / lisätietoa ongelmasta? Kuinka helposti sait ongelman ratkaistuksi? Kuinka kauan ongelman ratkaisu kesti?

21. Kuinka tyytyväinen olet virtuaalikampuksen palveluihin kaiken kaikkiaan? *

- ☐ En lainkaan tyytyväinen.
- ☐ Jokseenkin tyytymätön.
- ☐ Tyytyväinen
- ☐ Erittäin tyytyväinen.
- ☐ Täysin tyytyväinen.

SELOSTAVA OSA

Ole hyvä ja kuvaile, minkä toimintojen suorittaminen missäkin ympäristössä aiheuttaa sinulle ongelmia. Seuraavat kysymykset toimivat ohjenuorina ongelmien kuvailuun:

- *Mitä ongelmia mieleesi tulee kustakin ympäristöstä, mitkä seikat eivät täytä odotuksiasi esim liittyen käyttöliittymään, rakenteeseen ja sekavaan ulkoasuun?*
- *Minkälaisten toimintojen kanssa sinulla on tyypillisesti ongelmia?*
- *Löydätkö relevanttia apua/tukea/ohjeistusta ongelmiesi ratkaisuun?*
- *Kuinka helposti ongelmien ratkaisu onnistuu niiden ilmetessä?*
- *Kuinka usein kohtaat ongelmia ko. ympäristössä?*

Ilmaise vapaasti omia mielikuviasi, ideoita ja suosituksia kuhunkin ympäristöön liittyen. Jos sinulla ei ole mitään kommentoitavaa jostakin ympäristöstä, jätä kenttä tyhjäksi.

22. Lapin AMK:n nettisivu

23. Sähköposti

24. SoleOPS

25. WinhaWille

26. TimeEdit

27. Moodle

28. iLinc

29. Online-sanasto

30. Mahara

31. Optima

32. Lapinkampus blog

33. Lapinkampus Wiki

34. Kommentit

Mikäli sinulla on kommentteja, jotka eivät liittyneet aikaisempiin kohtiin, ole hyvä ja kirjoita ne alla olevaan kenttään.

Appendix 3.

1 (2)

INTERVIEW TRANSCRIPT WITH A: PRUIKKONEN, HEAD OF ELEARNING CENTRE AND ELEARNING DEVELOPER P. NIJBAKKER. CONDUCTED ON 02 FEBRUARY 2015.

Interviewer: How do you understand the concept of Virtual Campus?

P.N.: Our idea of the Virtual Campus is a site, an environment. Not only a website, but an environment, where people land and they find the easiest way, the shortest possible path to their destination. The environment should be constructed in such way, that people will be guided as efficiently as possible to the place, where they need to go. It is a “flat” page, not a 3-dimensional environment, like Second Life.

A.P.: One more principle on the university level is that Virtual Campus should include also the administration of students and their studies. However, the development of these service has not started yet, because we are a new organization. The standard processes of study offices were reorganized only year ago. The first year was focused about to get the routines running, to define the rules and get used to the new environments on campuses.

Interviewer: What can be the reason of dissatisfaction related to the Virtual Campus services?

A.P.: Usually students say, if Moodle is messy. But Moodle as an environment is not messy at all! It is up to the teacher how well has planned and organized the environment for the course. This problem originates from the lack of interest, the motivation of the teacher to take some time and sit down to design the environment. People are not motivated.

P.N.: Some people might say that other environments are easier, because they have they are simpler, they focus on one, specific module and it appears simpler. But on the other hand, they can perform less tasks in these environments.

Interviewer: Do you think that an integrated environment for the Virtual Campus developed by the university instead of several external systems would improve the satisfaction?

A.P.: It is really difficult to say. In my opinion, nowadays people more and more appreciate small apps instead of complex systems. However, this will lead to the consequence systems will be somehow different. The different interface is not a problem itself, but the different logic and structure of the systems is confusing. Some services, which I do not use every day I forget my passwords, because they are not integrated.

P.N.: I agree. One thing I noticed on the Lappia site that there is no information provided by the school anymore. For example, if you want to change your password for your e-mail, you get Microsoft support, which is completely different setup and structure. This is absolutely impossible for navigate for me. I had to use the search function to find how I can change my password. The logic is different, which makes the information more difficult to find for every user. Therefore, I was thinking about an interface for phones and computers, which has more hovering interaction than clicks and wherever you go, the breadcrumb guides you in the navigation.

Interviewer: How can we improve our Virtual Campus? What is the next step?

A.P.: I went to all the units of our university last spring, and I asked responsible persons about how they are dealing with the Virtual Campus. What are they doing in the virtual environments, how are they interacting and so on. The development started in a very user-centric way, but this is only about the employees. This is why I am interested in the students' point of view, because we only heard their points through questionnaires, which were typically not broad enough, or there were not enough answers to make conclusions. I think students' aspects should be discovered how these services could be put into one environment, one user interface. Also usability: what are the three main things, students would prioritize?

P.N.: The answer should be flexibility and ease of use, so maybe not click but hovers. Users should be able to see routes to access the information. There should be possibility to go between certain places through not only one, but different routes. The loading time and how many click and movement it requires to reach the information.

Interviewer: I would also say logical structure, because I am often confused where I should look for different course curricula, because for example BIT12, BIT13 and BIT14 are in totally different places.

A.P.: This is exactly what I said last week in our training. Intranet should be organized in a way that depending on what I am doing, the processes that I am tied to should be structured logically.

P.N.: The search function is also very important. Sometimes it was almost impossible to find, because it found something if you had the exact words.

INTERVIEW TRANSCRIPT WITH ENTERPRISE ARCHITECT T. LINDHOLM.
CONDUCTED ON 06 FEBRUARY 2015.

Interviewer: How SDL can be related to VC services?

Interviewee: E-Learning Services, as a department of a university, provide IT service in a sense, that they use their IT-related operant resources (knowledge and skills) to enhance the well-being of students. From the aspect of Service Dominant Logic, the service is the actual process in which employees of eLearning services indicate their resources to help students. Operant resources in this case also include information systems, because employees use those resources to act on others. In Service Dominant Logic it is possible to view information systems as operant resources.

If we think from Service Dominant Logic point of view, all these systems – Moodle, SoleOPS, Winha, TimeEdit – are indirect mechanisms of service provision. Assistance provided by eLearning Centre is a direct mechanism of service provision. Those different direct service provision mechanisms are very important aspects in Service Dominant Logic, because they involve hardware, software and information systems, which are indirect mechanisms. According to Service-Dominant Logic, the service should be co-produced with the customer or the intended beneficiaries. In this case it means that students who benefit from Virtual Campus services, directly through the assistance or indirectly through the usage of these systems, should be involved in the design. This is where Service Dominant Logic says, that service should always be co-produced, which means it should be designed together with the customer. In Service Dominant Logic the value can be determined only by the beneficiary. Since students are the main beneficiaries, only they can tell, if eLearning services (either provisioned directly or indirectly) are valuable for them. Therefore, it is very important that all stakeholders are involved in co-producing the service from the beginning.

Interviewer: Is software operant or operand resource in Service Dominant Logic?

Interviewee: Mostly it is operand, because software itself cannot create value. It is needed to be acted on with other resources (skills and knowledge). Then you use that resource to create value. In this aspect, software is always operand resource. Software item itself cannot create value either, for example your computer has a lots of software, but only some of them are valuable applications for the user.

Interviewer: How do users experience/value Virtual Campus services?

Interviewee: The definition of value in Service Dominant Logic is increase in the benefit. If I, as a student use Moodle, and if I feel that Moodle improves my well-being related to my studies, then I put value on eLearning services. Although, I do not understand that I appreciate eLearning services, because the goods-dominant approach (which is built in in all of us) says that I am valuating Moodle, which is indirect mechanisms from Service Dominant Logic point of view. Moodle itself is only a mean, which is used to provision service indirectly.

If an IT service provider looks at the Lapland UAS' environment, they will surely have goods-dominant perspective. They will see computers, software and infrastructure, additionally a huge of grey mass of users. They will be focused only on the well-being of the hardware-software items. In this case if we talk about Moodle for example, it means that the focus is laid on how well the Moodle is operating in a technical sense. Does it have enough computing capacity, memory, are the disks fast enough? There is this problem, when we build a system, which works perfectly from technical aspects, we do not know how it serves the users.

Interviewer: How value co-creation is realized in the Virtual Campus?

Interviewee: When we take the Service Dominant Logic aspect, and we take a look at the same context, setting or phenomena, we can see 5000 students, who have needs, a purpose. Moodle a service, which enables them to achieve their purpose. Then, we are focusing on the purposes of actors and study/observe/analyse how the indirect service enhances the well-being of actors. Service Dominant Logic enables to see the interconnections between actors and the relationships on the actor level. Then we can understand why certain information systems are there. When we understand a purpose of an actor, we can understand the purpose of the information system and then we can align them together. There are actors in Virtual Campus, whose purpose is to create value for students. Eventually, the value co-created in Lapland UAS is a combination of all these resources. Value co-creation is a result of undefined amount of various resource integrations and service for service exchange. In order for students to even access Moodle, the information management departments are involved, the hardware is prepared and running, the user accounts has been set up. Then there are teachers, who create the content of Moodle. It is not only the e-learning services, but the whole structure. Then there are students, who get the information from Moodle, to process and represent it. All these are needed to be in place, therefore the value is always co-created.

Furthermore, many student actors integrate their own resources. I studied in a remote group, where we integrated resources beyond Lapland UAS, for example Google Docs. It is also a question with the Virtual Campus: does it support the users' external resources? Actors also have different history. Those students, who come to our school each year, they have some previous knowledge about different kinds of systems. The question is, when they arrive here, how can they utilize their existing operant resources? In the past operant resources related to Google were not able to co-create values in our ecosystem, but nowadays because of the popularity of Google's solutions and Android phones seem to very popular. According to Service Dominant Logic, some of the resources in this case are only potential resources, which can become value-creating resources if the ecosystem facilitates their use.

Interviewer: How is it possible to involve students in the value co-creation process?

Interviewee: What I learned, during the collaboration with students it is hard to form a long-lasting relationship. If there is a group of students who collaborate throughout their studies, new ones should come instead of them when they graduate. This leads to a point, if we want to collaborate with students to design a service, we have to do that through the teachers. In fact, teachers represent students. Teachers educate hundreds of students and they get feedback directly from students during the lessons. It is the responsibility of the students to give feedback and explain why something did not work. There are surveys once in a year. In my opinion, 99% of the surveys I received (whether as student or staff) regarding the equipment or services, were not informational. The focus of the surveys are too broad to enhance the development. By this I mean, most often what they said was "this does not work, this is bad, why we cannot use something else?"

Interviewee: Did the institution have more freedom for development couple of years ago, when it was Kemi-Tornio University of Applied Sciences?

Interviewer: I am here since 2000, I have seen two mergers: the first one was with Lappia, the second was with Lapland University. It is a fact that in a sense we have less freedom. The reason is that environment is large and there are new requirements for the quality. I am only talking about technological aspects here, for example we had a huge infrastructure, which involves in addition to our school the Lapland University and the secondary vocational education in Rovaniemi. This means, we are operating in an environment around 500 servers instead of 70 servers. In this case the network protocols and many configuration aspects are so different compared to the “old days”. Earlier was easy to make changes, because we had limited amount of servers, we knew exactly how they work and how they are configured. We did not have huge virtual servers to run different services. Many processes and the technology has changed additionally to structural changes in the institution.

This organization is very new, required collaboration channels or interconnections have not yet been structured. Earlier we could design a change and implement it, it was okay. Now we need to have formal approach and access to make changes, which is probably is more difficult, but in the end I do not think the freedom is limited. We just need to act through formal processes to avoid confusion.

Interviewer: How Virtual Campus services of Lapland UAS could be improved?

Interviewee: I think we should try to find ways to systematically collaborate with students. If we could find a way to involve students in the development, their knowledge could be useful, because they are the key points in this system. In fact, e-learning employees cannot see the Virtual Campus the same way as students do, because they do not use it the same way. E-learning employees are looking at the services from technical aspect. Therefore, students’ knowledge should be involved in the value co-production. That information would be very valuable for the whole organization.

INTERVIEW TRANSCRIPT WITH EXCHANGE STUDENT A. BURIK. CONDUCTED ON 02. MARCH 2015.

Interviewer: Please introduce yourself shortly!

Interviewee: My name is Anina Burik. I am from Hungary, currently I am an exchange student at Lapland University of Applied Sciences. I arrived here in January and I will stay here until the end of the spring semester.

Interviewer: What does the concept Virtual Campus mean to you? Do you have a Virtual Campus at your home university?

Interviewee: I think Virtual Campus serves the needs of students, by allowing them to manage their grades, find study materials and to contact their teachers. Yes we have, but it is a bit different compared to what Lapland UAS has. At my home university we manage everything in one software, which includes basically all necessary features. We do not use iLinc or any similar tool at home, because my home university does not offer distant education.

Interviewer: In my thesis Virtual Campus means all online, computer-based, supporting features to study procedures. Just as you said, this includes Index Management Systems, timetabling, communication channels, learning environments such as iLinc and Course Management Systems such as Moodle in case of Lapland UAS. Additionally the administration, background procedures done virtually, like graduation and practical training procedures are part of Virtual Campus. In this sense, how do you use Virtual Campus services as an exchange student?

Interviewee: As an exchange student I check my timetable and e-mail every day. I do not use SoleOPS often, only once a week or once in two weeks. I use the Moodle system regularly. I can find there so many material and I know my duties for the classes. I have an online course, so I use iLinc also.

Interviewer: Do you use Virtual Campus as a communication channel?

Interviewee: I use only the e-mailing system to talk with the teacher from my iLinc-based course. Since she lives in Rovaniemi, I have no other choice but to contact her through e-mail.

Interviewer: Do you prefer this way of communication rather than face-to-face?

Interviewee: I like face-to-face more, because in real time conversation I can react immediately. But in some cases, if I cannot reach the teacher any other way, for example if the school is closed, of course I have to send e-mails.

Interviewer: What values do you prefer through the usage of Virtual Campus?

Interviewee: The Virtual Campus services at Lapland UAS for the first time seems not so simple. It was very complicated for me, I did not know how to use them, some pages were in Finnish language and I had to change them to English. After I learned, it was easy to use them. E-learning service employees helped me if I had problems during the usage of the services.

Interviewer: How is this Virtual Campus different compared to Hungarian system?

Interviewee: It is so much different, although we have the same Moodle for example at home. My home university has a very good system, where I can find everything, including my timetables, my grades and curricula of my degree program. I can sign up to and cancel exams. The system displays only those courses and exams, which are relevant for me. I think it is very useful that I do not need to open any separate system, I can do every kind of administration there. This system includes features related to payments, because Hungarian higher education is not always free. Some people have to pay for studies, dormitory fees or re-exams, which can be done through the same tool.

Interviewer: Is this too much complexity is a problem?

Interviewee: I think it is very logical and very easy to use.

Interviewer: Do you get more values from the Hungarian system? In other words, do you value the Hungarian system more than the Finnish one?

Interviewee: Yes, in my opinion the Hungarian system is better.

Interviewer: After all, how would you like our Virtual Campus to be improved?

Interviewee: I think it would be better to combine the services, put them together and make them as simple as possible from students' aspect. Maybe for other students it is easy to use the current systems, but for me it was confusing for the first time. TimeEdit works in a way that you have to look not for the lectures you are interested in, but the groups they belong to. Since I am an exchange student, I have courses with different groups. I have to put all the timetables of all groups together, and now my timetables are full of lectures, which I am not attending to. It is very confusing that I have to sort out my lectures all the time out of this mess. In the Hungarian system I can see only my courses and lessons I am attending to, nothing else.

Appendix 6.

1 (3)

INTERVIEW TRANSCRIPT WITH FULL-TIME STUDENT A. KLIMENKO. CONDUCTED ON 04 MARCH 2015.

Interviewer: I would like to ask you to introduce yourself.

Interviewee: My name is Artem Klimenko. I am first year Business Information Technology student. I come from Russia.

Interviewer: Before introducing the topic of my thesis to you, I would like ask for your opinion, what does the concept of Virtual Campus mean to you?

Interviewee: Virtual Campus means a study environment, which includes all different educational systems, for example timetabling, Winha and Moodle.

Interviewer: In my research, VC is a set of tools, which are essential parts of studies and the university. Now we are talking about Lapland UAS, but Virtual Campus services exist not only here, but at other universities. It involves Course Management Systems such as Moodle, Index Management Systems, such as SoleOPS and timetabling software such as TimeEdit. Additionally, it involves administration procedures for example application, practical training and graduation processes in which staff members, teachers and students are involved. All these systems serving the needs of students and their study procedures. In this understanding, which systems do you use and how at Lapland UAS?

Interviewee: I use e-mailing, I check it every morning from home. Sometimes I use SoleOPS, maybe once in a month to check my grades and different courses available, for example elective studies. Of course I use Moodle every day, except for weekends, to find due dates of assignments, to see different materials available. I use TimeEdit every day to check the date and place of my lessons. Sometimes I check Winha, but SoleOPS can be used for the same purpose, therefore I use that system instead.

Interviewer: Would you like these systems to be combined together into one environment?

Interviewee: Well, now I have got used to it and I can live with this solutions. When I want to check my timetables, I just type TimeEdit and my computer finds what I am looking for. Same situation is with my e-mail. For now, I do not feel that much discomfort, but maybe it can be integrated. Sometimes there are services, which combine a lot of different features and they get confusing.

Interviewer: Did you have problems earlier to use the current systems? How much time did you need to get used to the solutions?

Interviewee: During the orientation week we had trainings to the usage of the systems. I think in one week I could get used to the systems. Now I know what I should do and it does not take me time to think, how to do or access something.

Interviewer: Was the same experience amongst your classmates? Did you have to discuss about how to perform certain tasks in the Virtual Campus?

Interviewee: Maybe yes, I think I asked people how they performed certain tasks. I think everyone was almost in the same situation as me. For example there were some people, who asked how to access e-mail after 1-2 months of studies, when everyone was already using it. I think it is a problem of those people, everyone should check their e-mail at least weekly.

Interviewer: Do you prefer this way of communication rather than face-to-face?

Interviewee: I always prefer face-to-face, but in some cases I have no other choice, because I do not have any opportunity to talk face-to-face.

Interviewer: What values do you prefer through the usage of Virtual Campus?

Interviewee: I really appreciate flexibility and reliability, so I can access the systems and the data stored in them all the time. Therefore the systems should be reliable and available all the time.

Interviewer: Do our services provide these values to you?

Interviewee: Most of them do, I have not experience any major problems so far.

Interviewer: Do you participate in online lectures? What is your opinion about tools for online teaching/learning?

Interviewee: Yes I do. I use iLinc, which is quite good software, even though it looks outdated. It works all the time, it has no major errors during the usage. But I would really appreciate the possibility to adjust the volume of the software. If I do not hear the teacher, I put the system volume higher, and if other software, for example Skypes gives a notification, it is really loud.

Interviewer: Do you have the same attitude for online lectures?

Interviewee: It depends, because in online lectures we are free and we are not looked after. If I am interested in the course, I pay the same amount of attention, but there are some courses which are not that interesting, I get bored faster and I get distracted easily.

Interviewer: My last question is, how would you like our Virtual Campus services to be improved?

Interviewee: Maybe the integration is a good idea, but I would like to see it in advance how it will look like and work. What I would like to be improved, is the library system. This is really difficult, because you start using the online library to find sources, then it redirects you to the website of the establisher, then you have to login once more. It is really difficult to find established sources, books, scientific articles and thesis works. I think the library system should be improved somehow. Otherwise the rest is alright, if it would be combined maybe it would become easier.

Appendix 7.

1 (2)

INTERVIEW TRANSCRIPT WITH STUDENT SERVICE COORDINATOR N. PIISPANEN. CONDUCTED ON 11 MARCH 2015.

Interviewer: Thank you very much for your participation. To start with, I would like to ask you to introduce yourself.

Interviewee: My name is Niina Piispanen. I am a student service coordinator at the student union ROTKO. I started to work at the university in September, 2011. At that time I was working at the university and the student union. Half of my time I was doing consultation services on behalf of the university. We had an office, where people who were eager to but not sure what to study could come in, and I was checking their backgrounds, interests and I gave them advices. The other half of my time I was working in the admission office as a secretary. In 2014 the Kemi-Tornio University and University of Rovaniemi merged together we created the new student union ROTKO, who wanted to hire me full-time.

Interviewer: What does Virtual Campus mean to you, how do you understand the concept of Virtual Campus?

Interviewee: Virtual Campuses are different kind of services based on latest technologies, which are used by students and employees of the university. I am not sure what kind of services are included in this package.

Interviewer: In my research, Virtual Campus is a set of tools, which are essential parts of studies and the university. Now we are talking about Lapland UAS, but Virtual Campus services exist not only here, but at other universities. It involves Course Management Systems such as Moodle, Index Management Systems, such as SoleOPS and timetabling software such as TimeEdit and online library services. Additionally, it involves administration procedures for example application, practical training and graduation processes in which staff members, teachers and students are involved. In this context, how do you use these services?

Interviewee: I use Moodle and iLinc for the tutor trainings, because I am the head teacher for student tutors. Other services, such as SoleOPS I do not use at all, because I am an employee of ROTKO, not the university, therefore I do not have access to these systems. I have certain contacts at the university to fill SoleOPS on the behalf of me. I also use e-mailing as a communication channel, and we have a new inner chat software (Microsoft Lync) between staff members. This software offers a possibility to contact teachers and staff members of the university in real time, but I cannot contact students there.

Interviewer: What do you think about these virtual communication channels? Do you prefer them rather than face-to-face?

Interviewee: Of course sometimes it's easier to talk face-to-face, but for me it is quite natural to use these. In our school it is necessary to use these programs, because we are not able to travel these long distances all the time. In ROTKO we use Google Hangouts, which is very good for us, because students can reach each other easily.

Interviewer: Do these external tools support or tools utilized in Virtual Campus?

Interviewee: I noticed that we have separate tools for staff members and students. These external tools are generally not used by staff members, because they use the internal tools for communication, which students do not have. Therefore, we need to find external channels to reach students effectively. I would like to see someday for example an internal chatting application which expand to students as well. In ROTKO we use Facebook to reach students fast, because it is a more effective way than e-mailing. Facebook is one of the main tools for my work, but school does not use Facebook at all, which is a problem, because it is much easier for students and teachers to reach each other through that channel.

Interviewer: In your opinion, are the different kind of tools, their different layout and structure causing problems in our university?

Interviewee: Yes, I hope someday in our school we will have this kind of system, which is an easy to use communication channel between students and teachers both on computer and mobile phones. Let's call it "Lapland Communications". Through this system we could find students by name as we have this for staff members. I can get phone numbers of university employees easily now, and send them text message or call them, but with students it is not the case.

Interviewer: Do you think this application could include more functions?

Interviewee: If it is simple to use and structured well, then it is okay. But otherwise, they should be separate I think.

Interviewer: What values do you prefer through the usage of Virtual Campus?

Interviewee: I think it must be easy to use. In many cases staff members have more difficulties than students to use new technologies. Also it should be cost-free for students. In my previous workplace we had inner communication system, which is missing here. I would really appreciate such tool.

Appendix 8.

1 (3)

INTERVIEW TRANSCRIPT WITH LECTURER S. JÄMINKI. CONDUCTED ON 11 MARCH 2015.

Interviewer: Thank you very much for your participation. To start with, I would like to ask you to introduce yourself.

Interviewee: My name is Seija Jäminki. I work here for more than 20 years. In 2008, I did my PhD work focused on synchronous and asynchronous online tools in our adult groups of Business Administration Degree Program. I work in online teaching since the 90s. I participated in development projects, and I also wrote couple of articles about distant education.

Interviewer: What is the composition of the students you are teaching? Are they usually adults or do they represent the younger generation?

Interviewee: Most of them are people, who work or live abroad. For example I have a student studying from England, another one from Germany. Most of them have “excuses” for not coming to the campus. Some of them are unemployed, and they cannot afford to travel, so they like to study online. Some of them are housewives with children, so they cannot leave their families behind, they have busy schedules. I think they have more motivation to learn, because most of them can connect their studies immediately to the working life. Managing distances is one of our goals by online education, which is an issue in Finland. We have a research team on involving and engaging people living in the rural areas, for example Saami people, which supports Virtual Campus in a way.

Interviewer: How do you see the motivation of students in online courses?

Interviewee: We have two types of students. The motivation of adult students is really high, especially if they can integrate their studies to their jobs. Quite often the knowledge background “average” students is narrow, sometimes it is difficult to understand what they are talking about. Sometimes it is funny to see that some students get lazy on regular lessons, but when they come to adult groups, they see the fact that adults work hard, which affects their motivation too in a positive way.

Interviewer: How many technical issues do adult students have? Do they need extra training or attention?

Interviewee: Of course they do, they are not digital natives like young people. They are digital immigrants, we always take this into account. There is a course in eLearning, where they learn how to use the tools we have. Then there is eLearning support until 9 PM every day. The software itself is not that difficult for students. I think it is more demanding for teachers, who have a lot of activities and a higher role. Some students are really afraid of these tools when they start, but quite soon they get used to them.

Interviewer: What tools do students usually use to solve tasks?

Interviewee: There is always a difference in the selected tools. I always let my students decide, what they want to use. Almost all of them choose Google Drive or OneDrive to share files, it is up to them. Some students use Google Hangouts. Younger students typically use Facebook. They can use iLinc if they want to. Although we deliver a way of education, there is always the flexibility and a chance to choose other tools for individual or teamwork. We also teach them how to use cloud services, such as Google Forms for teamwork tasks.

Technology is not a problem, the problem is usually in the mentality. According to researchers, 50% of students who choose online education believe that “you can study whenever you want to” and it is totally individual. They do not understand that there are synchronous iLinc sessions, where they have to attend, discuss, share and be prepared. Our practice is to run these classes, where students have to attend, discuss and learn together, plus they have individual and teamwork tasks where they can select what to use. Usually I ask for two individual tasks, discussions, blogs and teamwork/case studies where students can apply what they have learned from the materials.

Interviewer: How do you see the systems used by Lapland UAS? Are they organized and working well, from teachers' and students' point of view?

Interviewee: If I think from an online teacher's point of view, Moodle develops very quickly. Since Moodle is open source, for a novice teacher it could be difficult to learn how to use it. SoleOPS, Winha, TimeEdit and the other systems are too complicated and they take a lot of time from teachers' work in my opinion. Maybe there are better tools, but now we have these, and it is quite hard to make any changes. Not only traditional, but adult students have to use these to sign up to courses, which is really critical for them, because they are not here to contact the teacher if they have problems.

3 (3)

Interviewer: If there is a way, would it be good idea to develop Virtual Campus together, involving teachers and students in the design?

Interviewee: Service design is an important issue, but nobody asks us what systems we would like to use, because it takes too much time. If I think how to plan Virtual Campus, I would like to have more flexible, customizable, modular systems, where we could choose which module to take and use.

Appendix 8.

1 (3)

INTERVIEW TRANSCRIPT WITH PRINCIPAL LECTURER V. RYABOV. CONDUCTED ON 13 MARCH 2015.

Interviewer: Thank you very much for your participation. First of all, I would like to ask you to introduce yourself. Who are you, what is your occupation at the university and how long have you been here?

Interviewee: My name is Vladimir Ryabov. I am principle lecturer in Information Technology in the faculty of Business and Culture. I am working at this university since 2004.

Interviewer: How do you understand the concept of Virtual Campus, what does it mean to you?

Interviewee: Different set of tools and services, which help students to study distantly, but also these tools should help students to study face-to-face. Through the tools students can get access to proper information, study material. In general Virtual Campus facilitates the education and administrative processes of teachers and staff members.

Interviewer: How do use Virtual Campus services as a lecturer at Lapland University of Applied Sciences?

Interviewee: I use them every day basically, but I use them for different purposes. For educational purposes we use these purposes to upload study material, do evaluate coursework, to update curricula, to put grade to students. Additionally, we need to use these services for some administrative tasks, for instance our working hours, recording our travel information, staff mobility information and many other things.

Interviewer: They sound quite complex and it seems to have many procedures.

Interviewee: The main complication comes from having totally different tools. We are often confused to select which tool to use, and when to use it, because not all the tools are used on daily basis. Quite many of my colleagues, including myself, do not remember how to use some of the tools. For instance there are some tools, which I use once in every half year to record extra hours of work and honestly I do not remember the interface. Of course the tools we use every day are easy to learn and we do not have problems with them, for example Moodle is a very good tool.

Interviewer: What values do you expect from these tools?

Interviewee: First of all I expect usability, I expect these tools to be easy to learn, easy to remember how to use. I expect will not complicate more than they facilitate. We have some example tools, which are not really usable, for instance Winha. I think the interface of Winha is from the last century, it is absolutely not usable, not up to date and it does not corresponds to users' expectations nowadays.

Interviewer: In general, do you get these values?

Interviewee: It depends on tools. From some tools I do, for instance I am really happy about Moodle, it is good, clear and understandable tool, but with some other tools there are problems.

Interviewer: Do you use Virtual Campus as a communication channel?

Interviewee: Not very often. Amongst staff members we have a tool, which we use for chatting/communication, but I used it only couple of times. Usually I meet the person or I send e-mail of course. Quite often more person are involved in the conversation, therefore I send e-mail instead. E-mailing is used all the time.

Interviewer: Is it easy to reach all the audience, for example students, through e-mailing?

Interviewee: The official rules of the school says, students should read their e-mails, because it is a more or less reliable channel of communication. In some cases it happened that students were using their own, "strange" e-mail accounts and teachers didn't get the messages because of spam filters. That's why we recommend students to use school e-mail to communicate with teachers. In my experience most of the students use school e-mailing. Some of my colleagues communicate on social media with students, but I think it is not a good way to do it, because there is no privacy. Some of the information which is published on social media might be confidential about internal processes or studies, which should not be made public.

Interviewer: Do you participate in online lectures?

Interviewee: Definitely, yes. I am teaching several courses on the Business Administration Master program, which is 100% online. I have already 18 years' experience in online lecturing.

Interviewer: What is your opinion about the tools we are using?

Interviewee: We use iLinc program. Generally it works correctly, it is more or less easy to understand and learn from my point of view as a software engineer, others might have different opinion. There are some technical issues with running, because it does not run on all the browsers, but otherwise nothing serious.

Interviewer: How do you see your students in online lectures, do they have problems?

Interviewee: They have some problems, but most of these come from their unpreparedness for the lessons, because they do not check their microphones and sound options. These things should be check in advance, before the lectures.

Interviewer: How do you evaluate students' performance in online lectures?

Interviewee: In the Master program we do not have traditional exams. We use online lecturing and discussion with students, because students are physically located in different places. We use Virtual Campus as a communication tool to facilitate learning. In my lessons I do not keep any exams, although I know that it is possible. Students submit their works, which are evaluated in the traditional way.

Interviewer: How would you like our Virtual Campus to be improved?

Interviewee: First of all, I would like to have less tools to be used. For teachers there are at least ten different tools available. I am not so happy about the website of our university, I do not think it is so usable. Sometimes it hard to find relevant, practical information for students and teachers. I do not know who the intended users of this website are, but it is difficult to use. For example the curricula of the degree programs should be available in 2-3 clicks, for prospected applicants it could be hard to find on the current website. I would recommend that the website include division into departments of degree programs, then every department would have individual space which they can develop. Currently departments do not have their own space, which is a problem I think, because departments should be able to update their own information regularly.

Appendix 10.

1 (2)

INTERVIEW TRANSCRIPT WITH A. PRUIKKONEN, HEAD OF ELEARNING CENTER AND ELEARNING DEVELOPER P. NIJBAKKER. CONDUCTED ON 08 APRIL 2015.

Interviewer: What are your impressions, what do you think about the analysis of the empirical data in chapter 5?

P.N.: The two points mentioned in the General observations (Section 5.2) through the SERVQUAL analysis are the first point of the analysis. The gaps at statements 12-13 is almost non-existent, which can be booked as a positive result. The other gap at statement 4 is one of the main issues is about the availability or the access to manuals. The comments on the old-fashioned interface of Winha are not a surprise, these tools are old in fact. In my opinion, it is surprising that comments the e-mailing are relatively positive. Earlier we had much more struggles, but now it seems, users use this tool more often and they got used to it now. Some of the results shown in the usage diagrams are interesting. For instance the usage of the Blog and Wiki is surprisingly low. The high number of tools is a relevant issue for a long time, but it was never resolved.

A.P.: The number of tools is high in fact, I agree. However, at the moment it is really hard to resolve this issue. Maybe in the long run it will be possible, but not from one day to another. The dissatisfaction can also derive from the motivation as well as the many different tools as you highlighted in the analysis. The little usage of library service is surprising and during the recent libraries the satisfaction was higher. The different user interfaces and information structure, as you mentioned in the analysis, are indicators of confusion and dissatisfaction.

The library databases are not used by students probably because it is much more convenient to use Search Engines and Internet to look for material. This is really strange, because library is one of the most important and helpful tools, which we also instruct to the users. We agree that a further analysis on the website is needed, including analysis how users use the website. For instance, do they look for information or do they just use it to get access to other tools?

P.N.: After all I believe, the research derived many useful and highlighted most important findings from this huge amount of data. The findings match our expectations, we already noticed some of the issues. Yet we had no proof and research behind our assumptions. Therefore, the research is very useful for us, because it provided us a good understanding about the current situation. We already used some of the diagrams and findings of the research on our meetings.

Interviewer: What are your impressions, what do you think about the development suggestions in chapter 6?

A.P.: We like the development idea of Student Pages, which could be the first page or “landing page” of the Virtual Campus. We discussed about this idea on a meeting also, but we need to see first what the role of this service is, how it can be connected to other tools and who the main users are. I would extend the idea with the possibility of more customization, for instance I (as a staff member) could select which tools I would like to see in my favourites, meanwhile I use the same environment what students use. It could have some logic built in, which recommends me to include or exclude tools in my favourites depending on my interactions.

We already started to plan a similar service based on WordPress. WordPress it is optimized for mobile devices, which is a relevant issue as it was highlighted in the research. The systematic cooperation suggested by T. Lindholm and you is relevant, it should be considered, for instance through the development of Student Pages, as you suggested.

P.N.: I agree, the school could have something more integrated, so the tools what I need are immediately available on the top of the page. Alumni services are missing. There were plans to include Alumni services in Mahara, but was not realized yet, which is a problem. It would be a great opportunity to grant students more insight to the working life, let them to create connections and vice-versa. Virtual Campus should include this tool as well, there is a need for that.

Statistics show that the usage of mobile devices are increasing constantly. As you mention amongst your suggestions, the development and the optimization of the tools for mobile devices is an important issue.

Interviewee: How useful my research is for you as eLearning Services and the whole organization?

P.N.: The results proved my assumptions in many aspects and it was very enlightening how our department scored. We received clearly good feedback on our work. There are no disastrous nor extremely positive findings. Our thoughts were proved through this thesis work.

A.P.: From the organization’s point of view it is really difficult to say at the moment. The research is clearly useful for the organization as well as it is to us, but we cannot say anything on the institution’s behalf. As eLearning Centre we will discuss the results, we already started some threads based on the findings. On our part it is always possible to involve students in the eLearning design. However, raising the cooperation to a higher level is really hard. One thing is for sure: if we plan to design something together with students cooperatively, we will include service design principles and experts to manage the procedures.